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Report No.

FIRE SAFETY ANALYSIS OF THE POLAR ICEBREAKER REPLACEMENT DESIGN

VOLUME II

BY

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16. Abstract

This report documents the developmental application of the Ship Fire Safety Engineering Method (SFSEM) to the fire safety analysis of the Polar Icebreaker Replacement (PIR) design. The passive and active fire protection were analyzed in the integrated framework provided by SFSEM for every compartment on the PIR. Conventional fire protection engineering was employed whenever information necessary for SFSEM was not available. Recommendations for alternative solutions to fire safety discrepancies and guidelines for fire protection systems on the PIR are provided.

Five levels of fire protection were found in the PIR design. Passive fire protection is the most significant factor in meeting the fire safety objectives. The major improvement recommended for passive fire protection is to subdivide the boiler room. Refinements are recommended for Active Fire Protection systems but the most significant recommendation is for improved and integrated automatic fire detection. With these changes the fire safety of every compartment is well within the fire safety objectives established. Smoke control was identified as the area where the most significant gains could be made in fire protection and life safety. The SFSEM

The Ship Fire Safety Engineering Method proved to be an effective method for integrating the five levels of fire protection on the PIR. An extensive data base was developed which will greatly facilitate future ship fire safety analyses. Output from SFSEM would be very useful in damage control planning.

This report is presented in three volumes. Volume I presents the recommended improvements to the PIR and the analysis which lead to them. Volume II presents the data necessary to conduct the analysis, and Volume III presents fire safety summaries for each compartment and its barriers.

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METRIC CONVERSION FACTORS

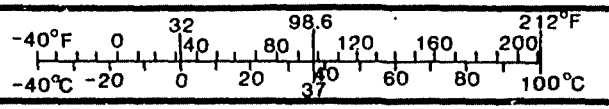
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (WEIGHT)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (EXACT)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures. Price $2.25. SD Catalog No. C13.10.286.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (WEIGHT)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	0.125	cups	c
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (EXACT)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



FIRE SAFETY ANALYSIS OF THE
POLAR ICEBREAKER REPLACEMENT DESIGN
VOLUME II

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APPENDIX A

Timelines for Ship Fires

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TIMELINE FOR SHIP FIRES

(Timeline done March 1987)

MFRB Report No. 001056 (USCGC CHASE)

Scenario:

A fire occurred in the engine room of USCGC CHASE on 8 May 1985 resulting in the death of one crewman.

Brief description of fire, origin and cause.

A 3/8 inch copper pressurized lubricating oil supply line for the port main diesel engine's two turbochargers failed. The resulting oil spray was ignited by the hot turbocharger housing. This violent oil fed fire in turn ignited surrounding paint, insulation, and electrical cables producing intense black smoke that rapidly filled the entire engine room. The fire spread to auxiliary machinery space #2 through an open watertight door.

Time Clock	Time (min.) Elapsed	Information Desired
1336	0	The fire started when pressurized oil sprayed onto hot turbochargers. This was caused by the failure of a 3/8" flared tubed fitting which supplies lubricating oil to the inboard turbocharger on the port MDE. Failure is attributable to lack of sufficient flare on the tubing end, led with excessive vibration due to a lack of support on that line. The force of the ignition was enough to knock a crewman backwards into the starboard MDE and thence down onto a catwalk. The initial fire spread rapidly rendering the entire engine room atmosphere untenable in less than one minute.
1337*	1	Upon hearing the throttleman's exclamation of "Fire", the EOW immediately reported the fire to the bridge over the 21MC and ordered the throttleman to pull the emergency mechanical trips on both MDE. The OOD ordered the general alarm sounded immediately upon hearing the report over the 21MC. All power was lost 10 seconds after the general alarm was sounded, both propulsive and electrical. The EOW realized immediately upon leaving the control booth that the EGT (emergency gas turbine) had not come on line as it should have when the electrical power was lost. He had difficulty getting the EGT started, taking several minutes.
1345*	8	Once the EGT was one line, a crewman started #1 fire pump. Initially this pump was receiving power from the EGT via the emergency thence the main switchboards. When the EOW isolated the feed from the emergency board to the main switchboards, power to #1 fire pump was lost. The power to this pump was restored after 1 minute.
1354	18	After extinguishing the burning insulation in auxiliary machinery space #2, a fire fighting party entered the engine room. They fought the fire first with water from fire hoses then with aqueous film forming foam (AFFF) from the twin agent unit (TAU) system. At this point, they discovered the fire mostly above them.

1359	23	A third fire fighting party entered the engine room via the inclined ladder that served as the normal main access. While they were awaiting orders to enter the engine room the deck became hot to the point that the deck tiles started curling and lifting. When the #1 nozzleman stepped off the ladder onto the upper level deck plates he felt the alumimun sag under his weight. This fire fighting team used AFFF and a four foot applicator. When they extinguished the fire on the upper level and in the overhead the fire was out.
1402	26	Fire is extinguished.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done March 1987)

MFRB Rpt. No. 001215 USCGC MIDGETT (WHEC 726)

Scenario:

A one-room mattress fire aboard the USCGC MIDGETT resulted in the death of one crewman and injury to a second, 30 March 1977.

Brief description of fire, origin and cause.

In the opinion of the investigating fire chief, the fire aboard the MIDGETT originated in the upper bunk as a result of a foam latex pillow coming into contact with the reading lamp in the upper bunk.

Time Clock	Time (min.) Elapsed	Information Desired
0247*	0	It is estimated that this fire probably started 30 minutes before detection. This is concluded because a suspended accoustical perforated aluminum ceiling melted away above the bunk.
0317	30	A fire was detected by 3 separate people either smelling rubber burning, smelling smoke, or seeing smoke.
0340	53	Announcement was piped on the IMC - "This is not a drill - we have a fire in CPO Quarters - All hands muster on the flight deck." Eight minutes later an announcement was made indicating that a fire was located in the laundry space. Another crewman reported that he was awakened and told that there was a pipe fire in the CPO Mess. There seems to be much confusion as to the location of this fire.
0343	56	Three crewman arrived on scene and discharged PKP extinguishers. They were the first on the scene, no one else was there.
0345	58	One crewman arrived on scene with OBA. He shouted for a fire hose. He received the hose but had no water pressure. At 0346 SUPCEN fire department units arrive on the scene. At 0346, #2 and #3 fire pumps were started.
0347	60	It is assumed at this point that water from the hose line is being used to extinguish the fire since the fire pumps were started one minute earlier.
0401	74	Log states fire out.

* = estimated time

TIMELINE FOR SHIP FIRES
(Timeline done April 1987)

MFRB Rpt. No. 001216 (USCGC DORADO)
Scenario:
Fire was discovered aboard the CGC DORADO on 10 September 1981. Estimated damage cost was $15K. One injury was incurred.

Brief description of fire, origin and cause.
Fire resulted in the engine room when compression type fittings vibrated loose on a pressurized lube oil line. The lube oil sprayed out and ignited on the exhaust manifold and turbo chargers.

Time Clock	Time (min.) Elapsed	Information Desired
1815	0:00	Fire started
1815*	01:00	The bridge heard a drop in main engine rmp and pulled the throttles to idle on two lift fan diesels. General quarters alarm was set and "Fire in the engine room" was piped.
1825	10:00	A crewman attempted to attack the fire using a 15 lb CO2 extinguisher but was forced to evacuate
1826	11:00	The engine room was evacuated and the fixed CO2 system was released
1827	12:00	The fire was extinguished

* = estimated time

TIMELINE FOR SHIP FIRES
(Timeline done April 1987)

MFRB Rpt. No. 001217 (USCGC POLAR SEA)
Scenario:
Fire was discovered aboard the CGC POLAR SEA on 6 July 1984. The class "B" fire caused 1.5 million in estimated damage cost. One injury was incurred.

Brief description of fire, origin and cause.
Fire resulted when overheating of the NR 1 purifier lube oil heater caused flange separation. Oil sprayed as a fine mist into the Diesel 1 space. Ignition sources included florescent lights, partrable blowers, and within the heater itself.

Time Clock	Time (min.) Elapsed	Information Desired
0242*	0:00	Fire started
0243	01:00	Fire alarm sounded in the Engineering Control Center
0245	03:00	General alarm was sounded, followed by an announcment of a fire in the Diesel 1 space
0250	08:00	50 lb CO2 system was expented but was not sufficent to effect a fire of this magnitude
0252	10:00	Hoses were ready for fire fighting
0???	40:00	Fire was extinguished

* = estimated time

TIMELINE FOR SHIP FIRES
(Timeline done March 1987)

FRB Rpt. No. 001218 USCGC CAPE GEORGE

Scenario:

A galley fire occurred resulting in the injury of one seaman on 20 November 1977, New Bedford, Massachusetts.

Brief description of fire, origin and cause.

A grease fire occurred as a result of a faulty burner switch in the ship's galley.

Time Clock	Time (min.) Elapsed	
0515*	0	It is assumed that this fire started approximately 15 minutes before being detected even though the stove was last used at 0130. An omelet pan isn't that large, therefore, it could not hold much grease.
0530	15	The fire was detected when the watchstander entered the galley and observed smoke and flames coming from the omelet pan on the galley stove. He attempted to extinguish the flames by throwing a coat over the fire, but when backing away from the flames, the coat caught on his knife sheath and spilled the pan's contents of cooking grease. Supposedly, the pan had been used at approximately 0130 by another crewman. Due to a faulty stove switch, the burner had not been properly turned off.
0533*	18	The fire was extinguished after the watchstand extinguished the burning grease which had spilled on him and awakened the OOD.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done March 1987)

MFPB Rpt. No. 001219 (USCGC DURABLE)

Scenario:

On 4 December 1980, fire was ignited onboard the USCGC DURABLE, at 1355 hours. The fuel oil fire was quite extensive, consuming 140 gallons of lube oil. One fatality resulted along with an estimated $750K to $1M damage.

Brief description of fire, origin and cause.

Fire was ignited in the Engineroom when a throttleman began unauthorized maintenance on a pressurized lube oil line on an operating engine. Oil sprayed from the loosened flange and ignited by contact with the turbo charger casing. The rapidly expanding fire created thick black smoke and intense heat.

Time Clock	Time (min.) Elapsed	Information Desired
1354	0:00	Fire was ignited.
1355	01:00	Fire was seen by the engineering watch officer from the control booth who signaled the bridge on the emergency call bells to bring engines to "All stop". After hearing the bells and setting engines to idle, the bridge watch sounded General Quarters.
1375*	21:00	During the interim period, fire fighters were experiencing difficulty maintaining fire main pressure. They were able to enter the engineroom only for brief times before pressure was lost due to breakdown of the emergency diesel generator. Also, the engine room watch was unable to fight the fire with the twin agent system located on the upper level of the engine room, due to intense heat and smoke.
1405	51:00	Completed closing the starboard main engine mess deck remote fuel cut off valve.
1415	61:00	Fire party was able to direct a stream of foam on the forward end of the port main engine through a scuttle. This continued for about 20 minutes before the open flames died out.
1437	83:00	After the open flames died out many independent parties attempted to attack the remaining fire with several different agents. The aft hose party was able to reenter the engine room after fire main pressure was regained. Light water and powder hose system was used with no sucess. Someone discharged a Nitrogen bottle. PKP extinguishers were being used as well as fog and spray nozzles.
1519	165:00	The fire was reported out.

Comments: An excess of toxic fumes were produced through the burning of polyurethane (ventilation insulation), neoprene (piping insulation), and PVC (plastics). This made the fire fighting procedures more difficult for fire fighters.

* designates an estimation

TIMELINE FOR SHIP FIRES

(Timeline done 3/87)

MFRB Rpt. No. 001221 USCGC MOHICAN (WYTM 73)

Scenario:

A fire began in the vicinity of the Starboard Main Engine forward onboard the USCGC MOHICAN (WYTM 73) on 10 November 1977 while underway on outer-harbor patrol.

Brief description of fire, origin and cause.

The fire was caused by a broken fuel return line that runs alongside and above the exhaust manifold. The exhaust manifold knuckles had not been lagged because of expense. PVC piping ignited and caused extremely toxic fumes which prevented entry to the compartment for securing engines and fire fighting.

Time Clock	Time(min.) Elapsed	Information Desired
1057	0	Two personnel on watch observed flames coming from the upper portion, forward of the starboard main engine.
1057*	:10	Two additional personnel in the generator room aft of the engine room cleaning, heard the word "Fire" passed.
1057*	:12	The two crewmen in the generator room grabbed a 15 lb. PKP extinguished located on the starboard side aft in the engine room but they were unable to charge it because they could not remove the pin. A 50 lb. CO2 system located port side on the lower level could not be activated because of the intensity of smoke and fumes.
1057*	:14	An attempt was made to notify the Bridge that there was a fire but the phone was being repaired on the messdeck. The bells were pressed a number of times on that line and then the crewman raced out of the engineroom to the Bridge to inform them that there was a fire.
1057	:15	The PKP extinguisher is finally charged but smoke was so heavy the crewman felt he could not carry it from port to starboard. Smoke and fumes are so dense that all personnel were forced to leave the engineroom.
1057	:20	All personnel on the interior of the ship were forced outside.
1057*	:20	During the time personnel in the engineroom were attempting to apply firstaid to the fire, the bridge piped fire and rang general alarm. The MOHICAN came to an all stop.
1100	3:00	Fire party is manned and ready. All topside doors, hatches, and vents were secured to prevent ventilation. Initial fire fighting commenced utilizing a 15 lb. CO2 extinguisher.
1102*	5:00	Upon expending the third CO2 extinguisher at the bottom of the ladder, crewman noted static electricity within the compartment. Because of the heat the crewman had to leave.

1106	6:00	Initial attempt to fight the fire was aborted. Word is passed to the bridge that the ship sould anchor so that engines and generators could be secured.
1110	10:00	Additional manpower, fire fighting water and foam are on the scene. An additional OBA is provided by the tug "Tester", and foam is applied to the fire.
1120	20:00	USCGC CHOCK arrived on the scene to assist. An additional OBA man, foam, and fire fighting water along with a flame safety lamp were provided.
1140	40:00	The port engine was secured by an OBA man.
1143	43:00	The fire was reported out.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done 3/87)

MFRB Rpt. No. 001222 USCGC JARVIS (WHEC 725)

Scenario:

A fire occurred on the USCGC JARVIS 22 March 1978 in the #2 MDE. This was the second fire in the #2 MDE within a one month period.

Brief description of fire, origin and cause.

A build-up of oil ignited due to the rapid increase in the exhaust manifold temperature upon the full bell being answered. The fire occurred in the #2 MDE. The report states that "the lube oil buildup in the MDE manifold and fires are a problem of the 378's."

Time Clock	Time(min.) Elapsed	Information Desired
0825	0	Crewman noticed flames coming from the #2 MDE exhaust manifold. This crewman immediately notified another crewman of the fire.
0825*	:30	The second crewman ran to the front of the #1 MDE, removed a PKP fire extinguisher and attempted to activate it with negative results.
0826*	1:00	The fire was reported to main control, the engine was declutched and secured, and the bridge was notified of the fire.
0828*	3:00	The second crewman dropped the first extinguisher, retreived a second one, and attempted to activate it with again no results.
0830*	5:00	The same crewman retreived a third extinguisher, and appempted to activate it with yet again no results.
0831*	6:00	A third crewman was making a trip up from the third level of the engine room when he was alerted that there was a fire on the #2 MDE. This crewman grabs an extinguisher and extinguishes the fire.
0832*	7:00	The second crewman leaves the scene to retreive a fourth extinguisher.
0834*	9:00	Crewman returns with a fourth extinguisher and a reflash watch is set.
0839*	14:00	A reflash occurred and was immediately extinguished. A reflash watch was resumed. No damage was incurred to any machinery and the #2 MDE was placed back on line.
0839*	14:00	Fire is extinguished.

* = estimated time

Comments: Note that four extinguishers were retrieved before one was activated. The report states "the caking of powder in the PKP extinguishers located adjacent to the MDE's is a result of vibration". Maintenance requirements state that the PKP fire extinguishers be inspected on a monthly basis by inverting the canister and vigorously shaking it to loosen the PKP powder. The investigation does not address the issue of whether or not this procedure was being carried out on JARVIS prior to this fire.

TIMELINE FOR SHIP FIRES

(Timeline done 3/87)

MFRB Rpt. No. 001223 (USCGC MACKINAW)
Scenario:
A hold fire occurred onboard the USCGC MACKINAW on 14 December 1947.

Brief description of fire, origin and cause.
It is believed that the fire was caused by spontaneous combustion of the sisal line being used for the manufacture of fenders.

Time Clock	Time(min.) Elapsed	Information Desired
2237*	0	It is believed that the fire started approximately 30 minutes or more before being detected because of charred cork ceiling. It is difficult to make an estimate because bulkhead and deck did not indicate any rise in temperature which would have been present if fire had been burning for any considerable period of time.
2307	30	The Coxswain of the Watch notified the First Lieutenant that there was a fire in the after hold.
2308*	31	General alarm was sounded after a crewman made his way from the wardroom to the bridge. Ventilation was on when fire was discovered and was secured together with all other ventilation fittings when alarm was sounded.
2311*	34	Three 2 1/2" fire hoses were led out and utilized through the escape hatch. No flames were visible but dense yellow smoke was seen rising from escape hatch in main hatch leading to after hold. No flame was observed at any time during the course of fighting the fire.
2315	38	Fire is extinguished.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done 3/87)

MFRB Rpt. No. 001225 USCGC BOUTWELL (WHEC 719)
Scenario:
A fire occurred aboard the USCGC BOUTWELL 9 Dec 1977 in the #2 Starting Air Compressor Motor.

Brief description of fire, origin and cause.
Smoke was discovered coming from the area between the MDE's. At no time was flame sited. It is believed that the smoke came from overheated insulation or a bearing failure. Investigation into the incident indicated that a dead ground and frozen bearings were found in the motor.

Time Clock	Time(min.) Elapsed	Information Desired
0950	0	Smoke was discovered coming from the area between the MDE's.
0950	:30	General Quarters was sounded for fire in the engineroom.
0951	1	Support Center Security was informed of the situation and directed to call the Seattle Fire Department. Also the USCGC MUNRO was notified of the situation and directed to standby.
0955	5	Compartment was sealed off by ship's personnel.
0955*	5:30	Two crewmen were sent in from the engineroom to investigate the cause of the smoke.
0956	6	Seattle Fire Department arrived at the pier.
0959	9	Two Seattle Fire Marshalls and fifteen firemen came aboard BOUTWELL.
0960*	9:30	Two crewmen sent to investigate could not find the source of the smoke but they did feel heat coming from the area of the air compressor.
0960*	10	Seattle Firemen entered the compartment from the machine shop area.
1007	17	Seattle Fire Department discovered the smoke to be coming from the No. 2 starting air compressor motor. Power was secured to the No. 2 starting air compressor motor, and a reflash watch was set.
1007	17	Fire is considered out, even though no flames were ever visible.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001226 (USCGC NORTHWIND)

Scenario:

Fire was discovered aboard the CGC NORTHWIND on 4 September 1964. No deaths occured and the estimated damage cost was $228.00.

Brief description of fire, origin and cause.

The class"C" fire started after the generator switchboard was dampened by a crew member. who was cleaning the tank top with a pressurized salt water hose. Arcing ignited wiring in the switchboard.

Time Clock	Time (min.) Elapsed	Information Desired
1458	0:00	Fire started
1459*	01:00	Back of switchboard was unlocked and the fire was made accessible
1459*	01:00	Fire was attacked by unspecified method
1461	03:00	Fire was extinguished

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001278 (USCGC CAPE UPRIGHT)

Scenario:

Fire occurred aboard the CGC CAPE UPRIGHT on 18 May 1977 at about 1645. The fire had burned undeteched of approximately five minutes. The class "A" fire which occurred during an overhaul procedure destroyed a crew berthing's head space. No injuries were incurred.

Brief description of fire, origin and cause:

The fire started during a welding procedure on the external part of the main deck. No fire watch was posted by welder to the compartment below. Consequently, ignition occurred within the neighboring compartment.

Time Clock	Time (min.) Elapsed	Information Desired
1645*	0:00	Fire started
1650*	05:00	Fire was detected by crewman who extinguished the flame in the berthing space. Smoke disabled him to detect fire in the berthing's head.
1653*	08:00	Forced ventilation was started to clear the smoke. This fanned the fire in the head.
1656*	11:00	A crewman went to the base fire house to report the fire
1657*	12:00	The fire house called the City Fire Dept. who reported with two trucks.
1657*	12:00	When the base fire dept. arrived on the scene much confusion resulted due to poor adherence to standard fire fighting procedure on the part of the senior chief.
1661*	16:00	The fire was extinguished.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done March 1987)

MFPB Rpt. No. 001229 (CGC JARVIS)

Scenario:

A leak in the lube oil line on the front of #2 MDE was discovered between 1030 and 1032 on 22 February 1978. Only the lube oil pressure line was damaged. The damage was kept to a minimum do to the quick action of the engineroom watch personnel.

Brief description of fire, origin and cause.

The engineroom fire was caused by lube oil streaming onto the hot inboard exhaust manifold. The leak in the copper tubing was due to chafing from vibration.

Time Clock	Time (min.) Elapsed	Information Desired
1034	0:00	Fire started. However, the leak which caused it was discovered before the start of the fire. Thus, at 1033 No.2 MDE was already in the process of being shutdown.
1034	00:00	The fire was never announced over ships communications.
1035	01:00	A member of the engineroom watch personnel attacked the fire with one PKP fire extinguisher.
1035	01:00	The fire was extinguished.

TIMELINE FOR SHIP FIRES

(Timeline done 3/87)

MFPB Rpt. No. 001227 USCGC NORTHWIND (WAGB 282)
Scenario:

A fire occurred onboard the USCGC NORTHWIND 23 February 1965 in the armory space.

Brief description of fire, origin and cause.

Valuable dry stores were moved to the armory space on [illegible] February 1965 to maintain security of the articles since civilian sand blasters would be using the access manhole. The fire was caused by heat penetration from a torch used by a civilian sand blester while flushing be[illegible] "I" beams. The civilian company responsible for the sand bla[illegible] job was submitted a claim for $713.00, the amount of the government-owned material destroyed.

Time Clock	Time(min.) Elapsed	Information Desired
1045*	0	Fire started in the armory space. (estimated)
1100	15	The report states that about this time, a crewman noticed thick, black smoke coming from an exhaust vent outside the towing winch room. He checked the towing winch room, found no indications of fire there and perceived the smoke was coming through a natural exhaust in the armory space. He proceeded to that area, found a locked door, and discovered bulkheads and doors which were warm to the touch. It was obvious there was a fire inside the compartment.
1102	17	The Officer on Duty was informed of the fire, and general quarters was set.
1103	18	The crewman who notified the OOD and set general quarters returned to the armory space and unlocked the Damage Control Locker. Attempts are made to break the door with a fire axe, but with no success. Crewmen obtained a pair of bolt cutters and these were used to cut the lock.
1105*	20	As the door opened a crewman began spraying into the compartment with a ships fire hose. The compartment could not be entered because of thick black smoke which billowed out so he stood in the doorway and sprayed as best he could. No flames were seen at any time.
1107	22	The first crewman to fight the fire was relieved by another crewman who continued to spray around the compartment from the doorway. He sprayed for about one minute.
1108*	23	Yet another crewman took the hose, entered the compartment and sprayed around the entire compartment.
1110	25	Two crewman entered the compartment with OBA's, took the fire hose and proceeded to completely extinguish the fire.

1116	31	The fire is extinguished.

* = estimated time

The report states the entire episode of the fire took not more than fifteen minutes. The general alarm was inoperative, as was the 1MC (general announcing system) due to yard repair. The work of the fire was passed by the quarterdeck messenger and the fire was fought by those first on the scene. My estimate of the timeline is based on the fact that the bulkheads and doors to the compartment were warm to the touch when the fire was discovered.

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001231 (CGC UNIMAK)

Scenario:

Fire was discovered aboard the CGC UNIMAK on 14 January 1977. The vessel had just arrived and docked after being towed into port due to previous difficulties. Estimated damage costs were $600,000. No injuries were incurred.

Brief description of fire, origin and cause.

The fire started when the badly spliced shore tie cable was energized. This cable had the potential to ground other phases in the ship's wiring. When this happened, the circuit breaker in the switchboard failed and the cable shorted out. Heat from this ignited oil vapor from fuel spilled on cable during the tow. The vapor ignited and the fire was fed by at least 100 gallons of diesel fuel.

Time Clock	Time (min.) Elapsed	Information Desired
1530	0:00	Shore tie energized
1545*	0:00	Fire started
555*	10:00	Fire discovered
1600	55:00	First alarm received by Boston Fire Dept
1602	57:00	Shore power was secured at dock
1605	60:00	First trucks arrived
1621	76:00	Second alarm sounded
1645*	100:00	Fire under control Note: Actual time of extinguishment is never stated in casualty report. Note: At time of incident only five or six men were aboard: therefore, they could not attempt to attack a fire of this intensity themselves.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt No. 001232 (USCGC VIGILANT)

Scenario:

Fire was discovered aboard the CGC VIGILANT on 4 December 1976. This class "A" fire caused $4165.19 of material and equipment loss. One injury was incurred.

Brief description of fire, origin and cause.

Fire resulted aboard the vessel when a piece of molten aluminum slag fell onto a tarpaulin wind barrier. The wind barrier was erected around the Radar system which was being installed

Time Clock	Time (min.) Elapsed	Information Desired
1220*	0:00	Fire started
1225	05:00	Fire was announced over the 1MC General Announcing Circuit and the New Bedford Fire Dept. was called
1230*	10:00	Fire was extinguished by the ship's fire party Mode of extinguishment was not specificed in casualty report

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001233 (USCGC BOUTWELL)

Scenario:

Fire resulted aboard the CGC BOUTWELL on 20 August 1977. Estimated damage cost was not reported; however, replacement insulation blankets were ordered for the area surrounding the #1 main gas turbine.

Brief description of fire, origin and cause:

Hydraulic oil was spilled onto the insulation blankets near the #1 main gas turbine when the hydraulic start oil return line failed. The class "B" fire resulted when heat from the operating turbine ignited the oil.

Time Clock	Time (min.) Elapsed	Information Desired
1530	0:00	Fire started
1530	00:00	General Quarters was announced
1532	02:00	Fire was reported out and a reflash watch was set in the engine room. Mode of extinguishment was not specified in the casualty report.

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFPS Rpt. No. 001234 (USCGC POLAR STAR)

Scenario:

Fire resulted aboard the CGC POLAR STAR on 15 June 1977 upon completing the calibration of a wattmeter. The damage cost was $79.28.

Brief description of fire, origin and cause.

Fire resulted in the #3S switchboard when two leads were replaced in reverse position at their terminals. When the fuses were replaced and the circuit energized a class "C" occurred.

Time Clock	Time (min.) Elapsed	Information Desired
1110	0:00	Fuses were replaced
1111*	00:00	Fire was detected
1111	00:00	A general alarm was sounded and the port fire party was called away
1112*	01:00	Fire was extinguished by several crewmen using portable CO2 extinguishers

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done 3/87)

MFRB Rpt. No 001235 USCGC DECISIVE (WHEC 629)

Scenario:

A fire is discovered in the laundry of the USCGC DECISIVE on 6 November 1976 while the ship was on an Offshore Fisheries Patrol.

Brief description of fire, origin and cause.

The fire is termed one of short duration in the laundry space (15-30 min.). This fire is of possible suspicious origin, but there is insufficient evidence to accuse anyone.

Time Clock	Time(min.) Elapsed	Information Desired
2300*	0	The fire is estimated to have started.
2307	7	Smoke was discovered in the laundry. The fire is reported to the bridge.
2307	7	General Quarters was set.
2315	15	The fire is discovered in the laundry and extinguished with PKP.
2315	15	The fire is extinguished.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFPB Rpt. No. 001237 (CGC JARVIS)

Scenario:

An electrical fire started on the deck of the CGC JARVIS at 1035 on 5 September 1976 while the ship was moored at Base Honolulu, HI.

Brief description of fire, origin and cause.

The electrical fire was caused by an improperly made splice in the shore-tie cable that had been lying on the main deck at frame 309. When the fire was discovered, sparks and arcing were observed.

Time Clock	Time (min.) Elapsed	Information Desired
1035	0:00	The report estimate for ignition
1036*	01:00	Fire was detected by a crewman. The control booth was notified on the ship's service phone.
1037*	02:00	Two crewmen attempted to extinguist the fire with two PKP fire extinguishers.
1040*	05:00	The quarterdeck watch made an announcement of a class "C" fire, and sounded the alarm.
1042	07:00	The quarterdeck watch phoned the CG Base OOD's office and reported the fire.
1044*	09:00	The duty electrician hastened ashore and disconnected the shore-tie from terminal 6.
1049	14:00	The fire was extinguished.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done March 1987)

MFRB Rpt. No. 001236 (USCGC JARVIS)

Scenario:

The USCGC JARVIS was berthed and on shore power and a "cold iron watch" was set. The boiler fire initially occured at 1009* on 26 August 1976. After the first fire was out a second occured at 1023*. The damage was estimated at $14,000. No injuries were incurred.

Brief description of fire, origin and cause.

The fire in the boiler was caused by an absence of water which gave rise to a soot fire. The absence of water was due to a malfunction of the thermal ring on the boiler and the low water hi-temperature thermostat.

Time Clock	Time (min.) Elapsed	Information Desired
1009*	0:00	Fire started in boiler
1010	01:00	Fire was detected under boiler 2 by a crewman. The crewman notified the people in the control booth who secured electrical power thus closing the fuel valve.
1011*	02:00	PKP and CO2 extinguishers were used to fight the fire and to cool down the unit.
1021*	12:00	The fire was extinguished and a reflash watch was set.
1023*	14:00	The boiler uptake was reported to be "cherry red" and getting hotter. The paint on the overhead above caught fire.
1024*	15:00	General Quarters was sounded.
1024*	15:00	The base fire department was called.
1025	16:00	CO2 was introduced into the smoke pipe of the boiler. PKP and CO2 was used on the boiler and the overhead. Water was introduced into the top of the boiler. Low velocity fog was introduced down the boiler smoke pipe from the stack deck.
1205	196:00	The fire was extinguished, and General Quarters was secured. Also the base fire department was released.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done 3/87)

MFRB Rpt. No. 001230 CGC JARVIS (WHEC 725)

Scenario:

A fire occurred aboard the CGC JARVIS 4 Feb 1978 with damage to the #1 MDE.

Brief description of fire, origin and cause.

The fire occurred in the #1 MDE when JP-5 sprayed onto the hot inboard exhaust manifold. A small hole in a 1/4" copper fuel guage line from the fuel supply header caused the oil to spray.

Time Clock	Time(min.) Elapsed	Information Desired
2244	0	The fire started when the oil mist ignited. It was detected promptly by watchstanders.
2245	1	The fire was put out with CO2 and PKP.

TIMELINE FOR SHIP FIRES
(Timeline done April 1987)

MFRB Rpt. No 001238 (USCGC BOUTWELL)
Scenario:
Fire was discovered aboard the CGC BOUTWELL on 17 August 1976.
No damage or injuries were incurred.

Brief description of fire, origin and cause.
During an investigation for the cause of exessive smoke accumulation near the #2 MDE, a crewman witnessed a flash from the underside of the turbocharger exhaust gas inlet elbow. The flash was followed by a fire.

Time Clock	Time (min.) Elapsed	Information Desired
0844*	0:00	Smoke was discovered investigated
0856	00:00	Fire started and general quarters alarm was sounded
0857*	01.00	Fire was extinguished with portable CO2 extinguishers

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001239 (USCGC EVERGREEN)

Scenario:

Fire was discovered aboard the CGC EVERGREEN on 19 November 1976. No injuries were incurred and damage was kept to a minimum.

Brief description of fire, origin and cause.

An electrical fire was discovered in the sewage system space after smoke was discovered. The fire started when a flood light fell onto the end of an energized welding cable which shorted and ignited combustible materials.

Time Clock	Time (min.) Elapsed	Information Desired
0645*	0:00	Fire started
0705*	60:00	Smoke was detected by crewman
0707*	62:00	Fire notification was piped over the 21MC
0709*	64:00	General Alarm was sounded
0710*	65:00	The Yard Fire Dept was called
0718	73:00	CG Yard Fire Dept arrived on the scene
0722*	77:00	Crewman extinguished fire (ten inches in diameter) with a CO_2 extinguisher

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFPB Rpt. No. 001241 (USCGC MACKINAW)

Scenario:

An electrical fire was ignited on board the CGC MACKINAW at 0224 on 22 February 1977. No personal injuries were incurred. Damage on the #3 main propulsion generator was estimated at 70,000.

Brief description of fire, origin and cause.

The electrical fire was caused by arcing in the #3 main propulsion generator which caused a subsequent fire in the stack. Reason for arcing in the generator was not specified.

Time Clock	Time (min.) Elapsed	Information Desired
0224*	0:00	Fire ignited
0225	01:00	Starboard motor room watch received a call from the brigde that the starboard shaft had been tripped off the causing an alarm.
0227*	03:00	Steam was sent up the stack to combat the stack fire.
229*	05:00	The #3 generator was taken off line and the excitation was shut off.
0230*	06:00	The blower and the engine were shut off. CO_2 was applied to the generator and the fire was extinguished.
0230	06:00	Although the fire was extinguished, smoking continued until 0600.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001245 (CGC RESOLUTE)

Scenario:

Fire was discovered aboard the CGC RESOLUTE on 4 February 1976 at approximately 2011. The fire was preceded by excessive smoke from intense heat.

Brief description of fire, origin and cause.

Fire started in the dry storage area when boxed stacked against the starboard stack ignited from intense heat. The abnormally high heat of the stack was caused when the priming value of the water cooling systems that were not in the correct position to circulate water to the starboard stack.

Time Clock	Time (min.) Elapsed	Information Desired
1925	(0:00)	#1 ship/service generator was secured. #2 ship/service generator became operational but the priming value was not in correct position to circulate sufficent water around the starboard stack.
1950	(25:00)	Stack alarm went off.
2000	(75:00)	A crewman informed the bridge that there was heavy smoke in the engine room and in area near dry stores and the starboard.
2001	(76:00)	General Quarters was sounded.
2006*	(81:00)	Starboard temperature indicator for the starboard stack read 545 degrees.
2007*	(82:00)	Emergency cooling system to the stacks was opened.
2011	86:00	Class "A" fire reported in dry storage. One of the boxed on fire was thrown overboard. The other box was put out by water.
2050	105:00	All compartments were desmoked and General Quarters was secured.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001247 (USCGC DECISIVE)

Scenario:

Fire was reported aboard the CGC DECISIVE on 19 March 1977. The fire had apparently been burning for aproximately ten minutes prior to detection. No injuries were incurred and estimated damage costs totalled $2400.

Brief description of fire, origin and cause.

The cause of the type "A,C" fire is unknown. Possibilities include electrical or carelessness when smoking. Cause could not be obtained from the evidence.

Time Clock	Time (min.) Elapsed	Information Desired
2035*	0:00	Fire started
2045	10:00	Fire was reported by a crewman to the OOD
2046	11:00	Fire fighters arrived on the scene and began to attack the fire with water through the metal grating face of the caged in storage area, but ineffectively
2110	75:00	The compartment was desmoked enough to locate padlocks of cage and gain access to the area of fire
2130	95:00	The fire was extinguished using a Purple K extinguisher

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001248 (CGC JARVIS)

Scenario:

Fire resulted aboard the CGC JARVIS on 12 November 1977 at about 1040. An explosion caused $13,500 in damage and no injuries.

Brief description of fire, origin and cause:

Fire resulted on the exhaust manifold due to explosions in the #1 MDE. The explosions were probably caused when exhaust ignited volatile crankcase gases and set the crankcase oil ablaze. Cause for this is questionable.

Time Clock	Time (min.) Elapsed	Information Desired
2040	0:00	Explosions in the #1 MDE resulted in fire on the exhaust manifold.
2041*	01:00	#1 MDE was shutdown and crewman notified bridge who set General Quarters.
2041*	01:00	While two crewmen attacked the fire with PKP and CO2 extinguishers another secured fuel to the engine and de-clutched it.
2045	04:00	The fire was extinguished.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done March 1987)

MFRB Rpt. No. 001250 (CGC SASSAFRAS)

Scenario:

Fire was discovered aboard the CGC SASSAFRAS on 27 April 1977 during decommissioning preparations. The electrical fire caused one injury and no deaths. No estimated damage cost was given because the vessel was being decommissioned for redesign in accordance with the WLB major renovation program.

Brief description of fire, origin and cause.

Smoke was detected eminating from a natural exhaust vent at 1522 hours on 27 April 1977. The electrical fire was caused by a RCA, Instant-On Color TV in the First Class Quarters, probably due to four power shifts between 1355 and 1501.

Time Clock	Time (min.) Elapsed	Information Desired
1500*	0:00	Fire started (estimation)
1522	22:00	Fire is detected by a DC1 and a LTJG on the mess deck when light smoke is seen coming out of natural exhaust vent on the after starboard corner of the buoy deck.
1523*	23:00	The two crewmen who discovered the fire attempted to enter the burning compartment with CO2 cylinders but the smoke was too thick to enter without an OBA. One went to the HORNBEAM for OBA's while another went to the engineroom of the SASSAFRAS to line up #1 fire pumps and secure all electric power on the panel except for power to the boom.
1525	25:00	A crewman tripped fire alarm station 4-5 and called extension 300 on the phone inside the warehouse. No exact location in the ship was given.
1535	35:00	U.S. Coast Guard Yard Fire Department arrived at the pier. They decided the crew of the SASSAFRAS should continue fighting the fire while they stood by.
1536	36:00	Two investigators from C.G. Base Fire Department are sent onboard to determine if the fuel tanks and small arms ammunition compartments are endangered by the fire.
1537	37:00	Two crewman entered through a hatch above the fire and began the attack the fire with water from a fire hose.
1542	42:00	The fire is reported to be under control.
1550	50.00	The fire is extinguished.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done March 1987)

MFPB Rpt. No. 001291 (CGC SHERMAN)

Scenario:

Fire was discovered aboard the CGC SHERMAN on 12 March 1977 while undergoing a trouble shooting test run of the gas turbine generator. The fire was started by fuel and lube oil spraying out of lines which were broken by an explosion. The explosion was initiated by a malfunction of the generator which caused it to overspeed.

Brief description of fire, origin and cause.

The fire was started by fuel and lube oil spraying out of lines which were broken by an explosion. The explosion was initiated by a malfunction of the generator which caused it to overspeed.

Time Clock	Time (min.) Elapsed	Information Desired
1820	0:00	Fire started (estimation)
1821*	01:00	Fire is detected by two crewmen who were working on the emergency gas turbine generator, the subject generator, at the time of the incident.
327*	07:00	The fire was extinguished by a crewman utilizing a 15 lb. CO2 fire extinguisher.

* = estimated time

Comments:

No times other than the approximated ignition time was given in the marine accident/casualty report. All times given here were estimates after reading the causualty report.

No evidence is found in the causalty report that the fire was announced over the ships communications.

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001240 (CGC WESTWIND)

Scenario:

Fire was discovered aboard the CGC WESTWIND on 9 March 1977. The class "A" fire caused an estimated $4,000 to $6,000 of damage. No injuries were incurred.

Brief description of fire, origin and cause.

Smoke was detected in a storage room. The point of origin was a bale of rags The cause for the fire is questionable. Probable causes include electrical cable failure, spontaneous combustion, careless disposal of smoking material, and arsony.

Time Clock	Time (min.) Elapsed	Information Desired
0025*	0:00	Fire started
0032	07:00	Fire was detected by a crewman who notified the bridge
0032*	07:00	Navigator on Watch sounded the General Emergency Alarm
0109	84:00	Fire was extinguished. Note: The casualty report did not specify the mode of extinguishment.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No. 001244 (USCGC COMANCHE)

Scenario:

Fire was discovered aboard the CGC COMANCHE on 1 May 1976. The class "A" fire caused no injuries and $1355 damage to clothing.

Brief description of fire, origin and cause.

Fire was detected by fire watch when welding caused combustible material to ignite in a clothing locker.

Time Clock	Time (min.) Elapsed	Information Desired
1140	0:00	Fire started
1145	05:00	Fire was extinguished using a CO2 extinguisher

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done 3/87)

MFRB Rpt. No. 001245 USCGC RESOLUTE (WHEC 620)

Scenario:

A fire occurred onboard the USCGC RESOLUTE 18 September 1976 in the #1 MDE.

Brief description of fire, origin and cause.

The report states that the cause of the fire in the #1 MDE was apparently the failure of the after main bearing in that engine accompanied by a crank-case explosion and secondary bilge fire.

Time Clock	Time(min.) Elapsed	Information Desired
January 26		
0938	0	Fire started (estimation)
0939	1	General Quarters, Condition I was piped to be set over the 1MC.
0940	2	Crewman informed Repair Party III of the fire in the After Void in person.
0950	12	Smoke was seen near the QAWTH.
0951	13	Shortly after discovery of smoke, bridge was informed of fire in After Steering.
0952	14	The #3 fire pump was started and Repair Party III began the attack the fire with water.
0958	16	The electrical load was taken off of the Emergency Gas Turbine Generator, and it was secured.
1110	172	The Class "A" fire is reported to be out.
1111	173	A reflash watch was set and standard compartment testing and desmoking procedures were followed until compartment was tested safe for men to enter.
January 27		
0820	0	Debris near the drain line of the muffler exhaust system began to smolder (no time was given for the extinguishment of this occurence).

TIMELINE FOR SHIP FIRES

(Timeline done 3/87)

MFRB Rpt. No. 001252 CGC MELLON (WHEC 717)

Scenario:

Smoke was discovered on board the CGC MELLON on 26 January 1977. The ship was set for Special Sea Detail but had not left port when the fire was detected and restrained. No injuries were incurred and damage cost was estimated to be $19,000.

Brief description of fire, origin and cause.

Smoke was detected near the After Void when a drain line from an uninsulated exhaust system caused material in the After Void to smolder. Smoke was detected on two different occasions but ignition occurred only on the first.

Time Clock	Time(min.) Elapsed	Information Desired
January 26		
0938	0	Fire started (estimation)
0939	1	General Quarters, Condition I was piped to be set over the 1MC.
0940	2	Crewman informed Repair Party III of the fire in the After Void in person.
0950	12	Smoke was seen near the QAWTH.
0951	13	Shortly after discovery of smoke, bridge was informed of fire in After Steering.
0952	14	The #3 fire pump was started and Repair Party III began the attack the fire with water.
0958	16	The electrical load was taken off of the Emergency Gas Turbine Generator, and it was secured.
1110	172	The Class "A" fire is reported to be out.
1111	173	A reflash watch was set and standard compartment testing and desmoking procedures were followed until compartment was tested safe for men to enter.
January 27		
0820	0	Debris near the drain line of the muffler exhaust system began to smolder (no time was given for the extinguishment of this occurence).

TIMELINE FOR SHIP FIRES

(Timeline done April 1987)

MFRB Rpt. No 001253 (M S. SCANDINAVIAN SEA)

Scenario:

Fire was discovered aboard the M.S. SCANDINAVIAN SEA on 9 March 1984. No injuries were incurred Estimated damage cost was not included in the report; however, the entire forward third of the ship was involved.

Brief description of fire, origin and cause.

Smoke was detected in a passageway on the "A" deck. The fire was discovered in a crew berthing space on that level. A definite cause could not be determined; however, the fire seems to have been aided by a flammable liquid accelerant. Bottles of 151 proof rum were evident in many crew spaces on the vessel but none were found in the room of fire origin.

Time Clock	Time (min.) Elapsed	Information Desired
1915*	0:00	Fire started
1930	15:00	Fire was detected by passing crew member who manually sounded the alarm. Immediately after, the bridge received an alarm by an automatic heat detector on the alarm panel. Fire dampers were closed remotely from the bridge.
1932*	17:00	Fire brigade arrived. The first method of attacked used on the fire was hand extinguishers (type not specified). The first extinguisher used failed.
1934*	19:00	The vessel's fire brigade then attacked the fire with water through several hose connections. The first hose used failed.
2035	120:00	Vessel arrived at Port Canaveral and disembarked all passengers and crewmembers.
2035*	120:00	At various times during firefighting operations the the firefighters reported that the fire was under control but it flared up again each time.
2300	385:00	Some passengers were allowed aboard to retrieve luggage.
1600	2700:00*	On 11 March 1984, Sunday the fire was offically reported to be out.

* = estimated time

TIMELINE FOR SHIP FIRES

(Timeline done March 1987)

MFRB Rpt. No. 001040 (SCANDINAVIAN SUN)

Scenario:

Fire is discovered aboard the cruise ship SCANDINAVIAN SUN just as it has completed docking at 2255 hours on 20 August 1984. The fire is an oil fire in the auxiliary machinery room. This fire results in the deaths of two people, one passenger and one crewman, and causes an estimated $250M damage to the ship.

Brief description of fire, origin and cause.

Oil is observed spraying from the lubricating oil line to auxiliary engine #1. The hole in the oil line was created when a plugged elbow came loose. Ignition occurred during the process of trying to shut down the generator.

Time Clock	Time (min.) Elapsed	Informatic Desired
2256	00:30	Fire is detected by the second engineer in the fire area (auxiliary machinery room).
2259	3:30	Second Engineer goes to control room, located on the Tween Deck, and sounds fire alarm to the bridge and the officer's quarters. No location is given.
2310	11:00	Heat and ionization detectors were activated because when the Captain reached the bridge 14 zones were lighted on the display panel.
2313	14:00	Second Engineer who discovered the fire, attacked the fire with a water hose line through the watertight door from the Main Engine Room into the Auxiliary Engine Room. This was done after he has sounded the alarm to the bridge and officer's quarters, and shut down the auxiliary engine.
2327	28:00	The City of Miami Fire Department arrived and entered the ship through the starboard pilot door, crossed the car deck and attacked the fire through door 8. They reportedly reached the base of the stairs but were driven back by the heat. They then proceeded to the Engine Room where they attacked the fire through a watertight door which had to be opened for them. At this point, they report that the fire is nearly out.
0106	127:00	Fire is extinguished.

TIMELINE FOR SHIP FIRES

(Timeline taken from report)

MFRB Rpt. No. 000278 (Ship's Lounge Burnout Experiments, conducted in April, 1982)

Scenario:

A series of 1/4 scale and full-scale burnouts were conducted in order to examine the adequacy of fire protection regulations. Six full-scale burnouts were conducted in typically configured and furnished crew's lounges onboard test vessel A.E. WATTS.

Brief description of fire, origin and cause.

All the fires were ventilation controlled. In general, all tests were ignited successfully with milk containers in a wastebasket. The wastebasket was quickly overshadowed by the burning sofa which ignited from the wastebasket fire. In no case was flashover observed.

Time Clock	Time (min.) Elapsed	Information Desired

See attached sheets for a timeline from each of six experiments

TABLE 5

LOG OF OBSERVATIONS FROM BURNOUT 1 (CLOSED VENTILATION)

TEST TIME	OBSERVATION
00:00	Ignition in waste basket
00:30	Flames above top of waste basket
00:50	Flames to top of sofa arm
01:00	Vinyl on sofa caught fire
01:14	Flames to top of sofa back
02:00	Vinyl on side and top of sofa arm burning
02:55	Vinyl on top of sofa back burning
03:10	Top 1/3 of inner room smoke obscured.
04:12	Flames 1.5 ft above sofa back at starboard end
04:36	Burning plastic falling from sofa
05:07	Newspaper on left side of sofa caught fire
06:00	Flames within 1.0 ft of ceiling
06:12	Newspaper on left side of sofa totally involved
07:03	1/3 of surface area of sofa burning
08:40	Inner compartment smoke obscured
12:35	Fire ball swept across ceiling
12:48	Fire at lower right - probably chair 1 burning
13:20	Fire at lower right died out
15:30	Fire seen through smoke at lower right
18:00	Open flames at lower right
20:40	Entire right side burning (magazine stand/chair 1)
20:45	Video tape ends
21:55	New video tape begins - right side still burning
22:50	Entire screen filled with flames
25:10	Flames died out
57:00	Sprinklers turned on in compartment

TABLE 6

LOG OF OBSERVATIONS FROM BURNOUT 2 (CLOSED VENTILATION)

TEST TIME	OBSERVATION
00:00	Ignition in waste basket
00:33	Flames above top of waste basket
01:38	Flames to height of sofa arm
02:24	Sofa vinyl caught fire - smoke became darker
03:26	Burning plastic falling from sofa - small pieces
03:41	Flames to top of sofa at port end
06:28	Flames moving across sofa back
06:38	Instrumented doorway in outer room totally smoke obscured
06:48	Burning plastic falling from sofa back - large pieces. Carpet beginning to burn
07:11	Fire jumped to lampshade 1
07:35	Fire jumped to newspapers below lampshade 1
08:08	Inner compartment obscured by smoke - no visible flame. Audible heavy burning continues
11:00	Glow of fire in forward port corner
11:08	Fire flared up in forward port corner
24:00	Forward port corner, i.e., chair 1, fire alternately glows and becomes obscured by smoke
24:13	Flame from burning coffee table visible and growing
28:00	Flames from carpet immediately in front of camera obscure coffee table flames
31:00	Flames from coffee table still visible then die out
32:00	Flames occasionally slightly visible through smoke - audible crackle from fire through remainder of test
68:23	Sprinklers turned on in compartment

TABLE 9

LOG OF OBSERVATIONS FROM BURNOUT 3 (PASSIVE VENTILATION)

TEST TIME	OBSERVATION
00:00	Ignition in waste basket - burst of flame
00:17	Flames to top of sofa arm
00:23	Flames 1 foot above arm of sofa
01:00	Vinyl on side of sofa arm burning
01:15	Smoke in upper 1 foot of inner room
02:20	Papers on side table burning - burning plastic dripping on carpet
02:55	Rapid involvement of all papers on side table
03:12	Vinyl on back of sofa burning
03:47	Flames 1 foot above sofa back
04:00	Sustained burning of papers on carpet in front of sofa
04:35	Smoke in upper 2 feet of inner room - fire has progressed horizontally 2 feet across the back of the sofa
04:51	Lampshade 1 burst into flames
05:15	Back of sofa burning and burning plastic dropping on carpet
06:50	Fire completely obscured by smoke
09:55	Audible crackle from fire and flames visible in front of forward camera
10:40	Flames die out - fire glow visible through smoke
19:55	Flames visible through smoke in sofa and table areas
23:10	Flare-up visible through smoke in sofa area
23:25	Flames issuing from chair 2 into inner room
23:55	Extensive flames from chair 2
24:15	Flames near field upper right of camera view and continuing from chair 2
27:30	Flames dying down from chair
28:40	Smoke noticeably clearing from inner room
30:12	Inner room video camera malfunctioned
34:07	Increase in sounds from fire
36:40	Flames visible through smoke from outer room camera
39:30	Visible flames gone from outer room
43:20	Flames occasionally visible
45:00	Flames visible spiraling up from card table top and chair cushion
47:35	Smoke very transparent - furniture outline visible
48:01	Piece of Micarta fell across camera field of view
48:30	Card table top and chair cushions continue to burn
50:20	Chair cushions burnt out
52:00	Smoke denser and table top almost burnt out
53:26	Flames visible issuing from sideboard
58:00	Flames continue to be visible from top of sideboard
62:36	Sprinklers turned on in comparments

TABLE 10

LOG OF OBSERVATIONS FROM BURNOUT 6 (PASSIVE VENTILATION)

TEST TIME	OBSERVATION
00:00	Ignition in waste basket
00:40	Flames to the top of sofa arm
00:47	Newspapers on table burning
01:00	Flames to top of sofa back
01:22	Vinyl on side of sofa burning
01:50	Burning plastic dripped onto carpet
02:24	Smoke in upper 1 foot of inner room
03:00	Right front edge of sofa back beginning to burn
03:15	Flames consistently 1 foot above sofa back
05:30	Fire beginning to be obscured by smoke
05:43	Burning plastic dripping from back of burning sofa
06:52	Lamp shade burst into flames
06:58	Fire consuming 2 feet horizontally of sofa back
08:00	Fire consuming 4 feet horizontally of sofa back
08:20	Fire completely obscured by smoke
09:00	Fire barely visible but quite noisy
09:10	Fire not visible
10:20	Burst of flames visible - chair 1 burning
12:20	Flames progressed from right to fill entire foreground of inner room camera
14:30	Transparent flames visible in foreground and background of inner room camera
15:40	Flames being drawn from right side of sofa up to ceiling and over to exhaust duct
19:30	Fire dying and slightly obscured by smoke
24:00	Fire reintensifying
26:50	Chair 2 burning - flames visible from left side
27:45	Smoke obscuration of chair 2
28:05	Flames from left immediately in front of camera
33:40	Inner room almost completely clear of smoke/outer room still smoke obscured/lazy burning from partially consumed materials on deck
39:30	Condition still occurs in inner room/burning of chair 3 barely visible through smoke from outer room camera
41:30	Burning of chair 3 still visible
43:45	Flames burst forth in front of outer room camera
44:25	Flames in outer room visible from inner room camera
44:40	Smoke building up in inner room
45:30	Inner room smoke obscured/outer room actively burning
49:10	Carpet in outer room actively burning
49:40	Aluminum chair collapsed
51:20	Smoke clearing inner room/burning in outer room
57:00	Conditions continue - materials on sideboard burning
60:10	Sprinklers on

TABLE 13

LOG OF OBSERVATIONS FROM BURNOUT 4 (FORCED VENTILATION)

TEST TIME	OBSERVATION
00:00	Ignition in waste basket
01:40	Flames above waste basket
02:16	Flames above arm of sofa
02:38	Arm of sofa burning
02:45	Flames 1 foot above sofa back
02:50	Burning plastic dripping onto carpet
02:55	Smoke in upper 1 foot of inner room
03:15	Top of sofa arm burning
04:20	Right side of sofa back burning
05:00	Newspaper on table 1 burst into flames
05:35	Fire progressed horizontally 2 feet across front of sofa back
05:48	Lampshade on table 1 burst into flames
06:00	Back of sofa back burning
06:40	Top of sofa cushions burning Smoke beginning to obscure flames Carpet burning below sofa
07:09	Chair 1 burst into flames
07:35	Flames totally smoke obscured - fire noisy
09:10	Flames in left foreground
09:40	Flames in entire foreground
11:50	Flames totally smoke obscured
24:00	Inner and outer rooms continue to be smoke obscured
30:25	Lazy flames breaking through smoke in foreground of inner room camera
31:50	Flames dying out
32:30	Flames in lower right foreground
34:40	Flames dying out
43:00	Fire visible through smoke in outer room
47:00	Fire continues to be visible in outer room
50:20	Smoke clearing in outer room
51:00	Chair barely visible through smoke - burning throughout
52:00	Flames building
58:40	Flames from books on top of sideboard
63:28	Sprinklers turned on

TABLE 14

LOG OF OBSERVATIONS FROM BURNOUT 5 (FORCED VENTILATION)

TEST TIME	OBSERVATION
00:00	Ignition
00:14	Flames to top of sofa arm.
00:50	Flames to top of sofa back
00:54	Newspaper on table 1 caught fire
01:00	Plastic burning on side of sofa
01:20	Smoke in upper 1 foot of room
01:35	Burning plastic dripping onto carpet
01:43	Front and top of sofa back burning
02:08	Flames 1 foot above sofa back
02:50	Smoke beginning to obscure compartment
03:40	Outer compartment obscured
04:10	Burning plastic dropping from back of sofa
04:50	Fire 2 feet across back of sofa
05:15	Fire completely across back of sofa back
05:20	Fire 2 feet across front of sofa back
05:28	Lamp shade burst into flames
05:43	Newspaper in front of table 1 burst into flames
05:48	Newspaper next to chair 1 burst into flames
05:52	Sofa side of chair 1 burst into flames
06:05	Fire totally obscured by smoke
06:40	Smoke obscured flames from chair 1
08:15	Flames in front of inner room camera
09:30	Entire field of view inner room camera in flames Right arm of chair 1 burning
12:00	Fire smoke obscured
14:30	Flame building up in front of inner room camera
15:25	Carpet burst into flames in front of outer room camera
17:00	Fire visible on inner and outer room carpets
17:20	Fire totally smoke obscured
18:25	Fire visible in outer room
18:55	Collapsed aluminum chair visible/chair cushions burning/inner room filled with smoke
21:45	Chair cushions and table top continue to burn
26:00	Chair cushions burned out
33:10	Inner room burning in vicinity of table 1 - smoke clearing
34:20	Top of sideboard, chair 3 and table 2 burning
36:00	Card table top burned out
36.20	Remains of sofa flaring up
44:00	Top of sideboard, chair 3, tables 1 and 2 and sofa remains still burning/chair 3 collapsed
50:00	Tops of tables 1 and 2, and sideboard and remains of sofa and chair 3 still burning.
55:00	Above items still burning but less actively
58:40	Table 1 burned out
60:10	Sprinklers turned on

APPENDIX B

PIR Compartment Identification

A Cross Reference Guide for Compartment ID vs Compartment Name

Appendices B1-B3 are designed to be a reference guide to use in correlating Compartment ID's and Names. B1 is ordered alphabetically by Compartment Name; B2 is ordered numerically by Compartment ID; and B3 has compartments listed alphabetically by Use Indicator and ordered by Compartment ID within each Indicator.

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APPENDIX B1
COMPARTMENT NAME & ID
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

names out
02/08/1989 08:49:33
Page # 1

Compartment Name	Compt ID	Use ID
1ST LT OFFICE	1-187-2-QO	QO
AFT REPAIR NO.2	2-343-3-C	C
AFT REPAIR NO.3 & DAMAGE CONTROL WORKSHO	1-223-0-C	C
ANCHOR WINDLASS MACHINERY ROOM	1-22-0-Q	Q
ARCTIC GEAR LOCKER--OFFICER/CPO	01-162-5-A	AG
ARCTIC GEAR LOCKER--SCIENTIST	1-307-2-A	AG
ATHLETIC GEAR LOCKER	2-148-1-Q	AG
AUXILIARY GENERATOR ROOM (02 LEVEL)	02-178-0-E	E
AUXILIARY GENERATOR ROOM (03 LEVEL)	03-178-2-E	E
AUXILIARY MACHINERY ROOM	3-271-0-E	E
AVIATION OFFICE	03-218-0-Q	QO
BARBER SHOP	1-210-1-Q	QO
BATTERY ROOM	2-251-2-A	Q
BILGE TANK	4-311-0-W	W
BOAT GEAR LOCKER	1-207-5-A	AG
BOAT GEAR LOCKER	1-233-2-A	AG
BOILER ROOM (MAIN DECK LEVEL)	1-178-1-E	E
BOILER ROOM (MAIN DECK LEVEL)	1-178-2-E	E
BOILER ROOM (SECOND DECK LEVEL)	2-178-1-E	E
BOILER ROOM (SECOND DECK LEVEL)	2-178-2-E	E
BOSN'S LOCKER	2-343-2-A	AG
BOW BOOM INSTRUMENT ROOM	1-4-2-Q	Q
BOW THRUSTER MACHINERY ROOM	5-49-0-E	E
BOW THRUSTER MACHINERY ROOM	5-76-0-E	E
C G LOCKER	1-217-2-A	AG
C.G. LOCKER	1-218-2-A	AG
CARGO HOLD	3-49-0-AA	AA
CHIEF SCIENTIST SR	02-100-5-L	L1
CHILL STOREROOM	1-61-3-A	AR
CO CABIN	02-100-2-L	L
CO LOUNGE	02-100-1-LL	LL
CO SR	02-100-4-L	L1
COMMISSARY OFFICE	1-89-2-QO	QO
COMPUTER/NAV LAB	2-210-01-Q	QO
CPO BERTHING	01-100-4-L	L2
CPO BERTHING	01-113-2-L	L2
CPO BERTHING	01-125-4-L	L2
CPO BERTHING	01-162-6-L	L2
CPO BERTHING	01-142-2-L	L4
CPO MESSROOM & LOUNGE	1-124-2-LL	LL
CREW BERTHING	2-100-2-L	L10
CREW BERTHING	2-100-4-L	L10
CREW BERTHING	2-121-3-L	L10
CREW BERTHING	2-121-4-L	L10
CREW BERTHING	2-271-2-L	L10
CREW BERTHING	2-271-5-L	L10
CREW BERTHING	2-271-6-L	L10
CREW BERTHING	2-291-3-L	L4
CREW BERTHING	2-271-1-L	L6
CREW BERTHING	2-291-4-L	L6
CREW BERTHING	2-295-2-L	L6
CREW BERTHING	2-295-3-L	L6
CREW BERTHING	2-100-1-L	L8

CREW LOUNGE	2-100-7-LL	LL
CREW MESS	1-100-5-LL	LL
CREW STUDY	2-134-1-LL	LL
DRY LAB	1-239-0-Q	QS
DRY PROVISION STOREROOM	1-64-2-A	AS
DUMB WATTER	01-138-1-T	T
DUMB WATTER	02-138-1-T	T
DUMB WATTER	1-138-1-T	T
ELECTRIC SHOP	2-205-1-Q	Q
ELECTRICAL EQUIPMENT	2-223-3-Q	Q
ELECTRICAL EQUIPMENT ROOM NO.2	2-223-4-Q	Q
ELECTRICAL STOREROOM	2-195-1-A	AS
ELECTRONIC EQUIPMENT ROOM	03-105-1-A	Q
ELECTRONIC SHOP	03-106-2-A	Q
ELECTRONIC STOREROOM	03-132-2-A	AS
ELECTRONICS LAB	1-255-0-Q	Q
ELEVATOR	1-311-2-T	T
ELEVATOR	2-311-2-T	T
ELEVATOR TRUNK	3-311-2-T	T
ENGINE ROOM NO.1 (FIRST PLATFORM LEVEL)	4-100-0-E	E
ENGINE ROOM NO.1 (TANK TOP LEVEL)	5-100-0-E	E
ENGINE ROOM NO.1 (THIRD DECK LEVEL)	3-100-0-E	E
ENGINE ROOM NO 2 (FIRST PLATFORM LEVEL)	4-162-0-E	E
ENGINE ROOM NO.2 (TANK TOP LEVEL)	5-162-0-E	E
ENGINE ROOM NO 2 (THIRD DECK LEVEL)	3-162-0-E	E
ENGINEERING CONTROL CENTER	2-223-0-C	C
ENGINEERING LOG & DAMAGE CONTROL CENTER	2-146-2-Q	QO
ENGINEERING STOREROOM	2-65-1-Q	AS
EXO OFFICE	1-206-2-QO	QO
EXO OFFICE	2-130-2-QO	QO
FAN ROOM	01-239-8-A	QF
FAN ROOM	03-162-2-Q	QF
FAN ROOM	03-162-3-Q	QF
FAN ROOM	1-49-0-Q	QF
FAN ROOM	2-262-2-QF	QF
FIREFIGHTING EQPT ROOM	2-195-2-Q	Q
FLAMMABLE LIQUIDS STOREROOM	1-028-0-K	K
FORWARD REPAIR NO.3	2-65-2-C	C
FROZEN STOREROOM NO.1	1-49-3-A	AR
FROZEN STOREROOM NO.2	1-81-1-A	AR
FWD IC/GYRO ROOM	2-95-2-Q	Q
GALLEY	1-105-0-Q	Q
GEAR LOCKER	01-218-3-A	AG
GEAR LOCKER	01-218-4-A	AG
GEAR LOCKER	02-158-2-A	AG
GEAR LOCKER	03-157-2-A	AG
GEAR LOCKER	03-162-1-A	AG
GEAR LOCKER	04-126-4-A	AG
GEAR LOCKER	1-210-3-A	AG
GEAR LOCKER	2-100-3-A	AG
GEAR LOCKER	2-157-2-A	AG
GRAVIMETER ROOM	2-210-0-Q	Q
GREY/BLK WTR HOLDING TANK	4-262-0-W	W
HAM SHACK	03-154-1-Q	Q
HANGAR (02 LEVEL)	02-228-0-Q	Q
HANGAR (03 LEVEL)	03-228-0-Q	Q
HOUSEK STORES & SCIENCE CARGO	2-343-0-A	AS
HAZARDOUS MATLS. ROOM	1-344-0-K	K
HELO EQUIP ROOM & OFFICE	02-218-0-QO	QO
HOIST EQPT ROOM	01-311-2-Q	Q

HYDRAULIC PUMP ROOM	4-49-0-E	E
IC/GYRO ROOM	2-262-1-Q	Q
INCINERATOR ROOM	1-132-1-Q	Q
JP-5 SERVICE	4-299-1-J	J
JP-5 SERVICE	4-299-2-J	J
JP-5 STORAGE	4-271-3-J	J
JP-5 STORAGE	4-271-4-J	J
JP-5 STORAGE	4-303-1-J	J
JP-5 STORAGE	4-303-2-J	J
LIFE JACKET LOCKER	1-207-3-A	AG
LIFE JACKET LOCKER	1-223-4-A	AG
LUBE OIL	4-271-1-F	F
LUBE OIL	4-271-2-F	F
MACHINE SHOP	2-162-4-Q	Q
MACHINERY HOIST	2-145-1-T	T
MACHINERY HOIST	2-169-2-T	T
MACHINERY HOIST ROOM	1-145-1-T	T
MACHINERY HOIST ROOM	1-169-2-T	T
MAIL ROOM	1-210-2-Q	QO
MEDICAL STORES	1-199-1-L	L
MEDICAL TREATMENT & EXAMINATION ROOM	1-174-1-L	L
METEROLOGY LAB & CHART ROOM	04-126-0-Q	QO
MOTOR GENERATOR ROOM	3-223-0-E	E
MOTOR ROOM (FIRST PLATFORM LEVEL)	4-223-0-E	E
MOTOR ROOM (TANK TOP LEVEL)	5-223-0-E	E
OFFICER PANTRY	01-126-1-Q	Q
OFFICER SR	01-146-3-L	L
OFFICER SR	02-120-2-L	L1
OFFICER SR	02-122-3-L	L1
OFFICER SR	02-136-3-L	L1
OFFICER SR	02-136-4-L	L1
OFFICER SR	02-146-1-L	L1
OFFICER SR	01-100-3-L	L2
OFFICER SR	01-118-3-L	L2
OFFICER SR	01-132-3-L	L2
OFFICER SR	02-148-2-L	L2
OFFICER SR	02-162-3-L	L2
OFFICER SR	02-162-6-L	L2
OIL TANK	3-100-1-F	F
OIL TANK	3-100-2-F	F
OIL TANK	3-127-1-F	F
OIL TANK	3-127-2-F	F
OIL TANK	3-145-2-F	F
OIL TANK	3-162-1-F	F
OIL TANK	3-178-1-F	F
OIL TANK	3-178-2-F	F
OIL TANK	3-199-1-F	F
OIL TANK	3-199-2-F	F
OIL TANK	3-223-1-F	F
OIL TANK	3-223-2-F	F
OIL TANK	3-247-1-F	F
OIL TANK	3-247-2-F	F
OIL TANK	4-100-1-F	F
OIL TANK	4-100-2-F	F
OIL TANK	4-162-1-F	F
OIL TANK	4-162-2-F	F
OIL TANK	4-223-1-F	F
OIL TANK	4-223-2-F	F
OIL TANK	4-49-1-F	F
OIL TANK	4-49-2-F	F

OIL TANK	4-76-1-F	F
OIL TANK	4-76-2-F	F
OIL TANK	5-100-1-F	F
OIL TANK	5-100-2-F	F
OIL TANK	5-162-1-F	F
OIL TANK	5-162-2-F	F
OIL TANK	5-223-1-F	F
OIL TANK	5-223-2-F	F
OIL TANK	5-271-0-F	F
OIL TANK	5-76-1-F	F
OIL TANK	5-76-2-F	F
PANTRY	02-129-1-Q	Q
PASSAGE	01-100-2-LP	LP
PASSAGE	01-114-1-LP	LP
PASSAGE	01-162-2-LP	LP
PASSAGE	01-162-3-LP	LP
PASSAGE	01-178-1-LP	LP
PASSAGE	01-218-5-LP	LP
PASSAGE	01-292-2-LP	LP
PASSAGE	02-115-1-LP	LP
PASSAGE	02-121-2-LP	LP
PASSAGE	02-178-1-LP	LP
PASSAGE	03-111-2-LP	LP
PASSAGE	03-140-1-LP	LP
PASSAGE	1-100-0-LP	LP
PASSAGE	1-100-2-LP	LP
PASSAGE	1-100-3-LP	LP
PASSAGE	1-162-2-LP	LP
PASSAGE	1-162-3-LP	LP
PASSAGE	1-207-2-LP	LP
PASSAGE	1-223-2-LP	LP
PASSAGE	1-239-1-LP	LP
PASSAGE	1-319-0-LP	LP
PASSAGE	1-49-1-LP	LP
PASSAGE	1-49-2-LP	LP
PASSAGE	1-52-0-LP	LP
PASSAGE	2-100-0-LP	LP
PASSAGE	2-162-2-LP	LP
PASSAGE	2-162-3-LP	LP
PASSAGE	2-223-1-LP	LP
PASSAGE	2-223-2-LP	LP
PASSAGE	2-271-3-LP	LP
PASSAGE	2-271-4-LP	LP
PEAK TANK	2-014-0-W	W
PHOTO LAB	1-239-2-A	Q
PILOT HOUSE	4-108-0-C	C
PORTABLE VAN	-328-1-Q	QS
PORTABLE VAN	1-328-2-Q	QS
PORTABLE VAN	1-328-4-Q	QS
PUMP ROOM	4-271-0-E	E
Q.M. SHELTER	1-213-3-L	L
Q.M. SHELTER	1-223-6-L	L
RADIO ROOM	03-105-0-Q	Q
RECOMPRESSION AREA & DIVE GEAR LOCKER	1-271-2-Q	Q
REEFER	1-255-1-A	AR
REEFER MACHINERY ROOM	1-49-5-Q	Q
ROLL STAB TANK CROSS DUCT	01-178-0-W	W
ROLL STABILIZATION TANK	01-178-2-W	W
ROLL STABILIZATION TANK	01-178-3-W	W
ROLL STABILIZATION TANK	02-178-2-W	W

ROLL STABILIZATION TANK	02-178-3-W	W
SCIENCE & WINCH CONTROL STATION	01-319-0-C	C
SCIENCE REEFER MACHY. ROOM	1-245-1-Q	Q
SCIENCE STORAGE--AFT CARGO HOLD	3-311-0-AA	AA
SCIENCE STORAGE--UPPER CARGO HOLD	2-49-0-AA	AA
SCIENTIST BAGGAGE ROOM	01-218-8-A	AS
SCIENTIST COMM CENTER	01-312-2-Q	QS
SCIENTIST LIBRARY/CONFERENCE ROOM	01-271-2-Q	QO
SCIENTIST SR	01-225-0-L	L1
SCIENTIST SR	01-222-1-L	L2
SCIENTIST SR	01-222-2-L	L2
SCIENTIST SR	01-239-3-L	L2
SCIENTIST SR	01-239-4-L	L2
SCIENTIST SR	01-255-0-L	L2
SCIENTIST SR	01-255-2-L	L2
SCIENTIST SR	01-255-3-L	L2
SCIENTIST SR	01-271-1-L	L2
SCIENTIST SR	01-271-4-L	L2
SCIENTIST SR	01-271-8-L	L2
SCIENTIST SR	01-277-5-L	L2
SCIENTIST SR	01-292-4-L	L2
SCIENTIST SR	01-292-8-L	L2
SCIENTIST SR	01-311-6-L	L2
SCULLERY	1-119-1-Q	Q
SEA BAG LOCKER	2-49-1-A	AG
SEA CABIN	04-132-2-L	L1
SELF-SERVICE LAUNDRY	2-180-1-Q	Q
SHIP LAUNDRY	2-162-5-Q	Q
SHIP LIBRARY	1-100-6-Q	QO
SHIP OFFICE	1-198-2-QO	QO
SHIP STORE	1-162-4-Q	Q
SHIP STORE STOREROOM	1-162-6-A	AS
SMALL ARMS & DEM MAG	2-61-1-M	M
SMALL ARMS STOW & REPAIR	1-210-0-M	M
SODA STORAGE 1000 CASES	1-89-4-A	AS
STACK CHAIR LOCKER	2-100-5-A	AG
STAIRCASE	01-100-1-TS	TS
STAIRCASE	01-145-2-TS	TS
STAIRCASE	01-162-1-TS	TS
STAIRCASE	01-261-2-TS	TS
STAIRCASE	02-100-3-TS	TS
STAIRCASE	02-145-2-TS	TS
STAIRCASE	02-162-1-TS	TS
STAIRCASE	03-129-1-TS	TS
STAIRCASE	03-145-2-TS	TS
STAIRCASE	03-165-1-TS	TS
STAIRCASE	1-100-1-TS	TS
STAIRCASE	1-145-2-TS	TS
STAIRCASE	1-162-1-TS	TS
STAIRCASE	1-213-2-TS	TS
STAIRCASE	1-255-2-TS	TS
STAIRCASE	1-278-2-TS	TS
STAIRCASE	2-105-1-TS	TS
STAIRCASE	2-145-2-TS	TS
STAIRCASE	2-162-1-TS	TS
STAIRCASE	2-210-2-TS	TS
STAIRCASE	2-256-1-TS	TS
STAIRCASE	2-256-2-TS	TS
STAIRCASE	2-275-2-TS	TS
STAIRCASE	2-279-1-TS	TS

STEERING GEAR ROOM #1	2-361-1-E	E
STEERING GEAR ROOM #2	2-361-2-E	E
STOREROOM	01-153-1-A	AS
STOREROOM	01-255-10-A	AS
STOREROOM	02-145-1-A	AS
STOREROOM	02-162-2-A	AS
STOREROOM	03-147-1-A	AS
STOREROOM	03-157-1-A	AS
STOREROOM	1-154-1-A	AS
STOREROOM	1-207-1-A	AS
STOREROOM	1-4-0-A	AS
STOREROOM	1-49-4-A	AS
STOREROOM	2-154-1-A	AS
STOREROOM	2-22-0-A	AS
STOREROOM	2-388-1-A	AS
STOREROOM	2-388-2-A	AS
STOREROOM	2-4-0-A	AS
STOREROOM	3-22-0-A	AS
STOREROOM	3-4-0-A	AS
SUPPLY OFFICE	1-178-4-QO	QO
SUPPLY OFFICER OFFICE	1-178-6-QO	QO
THAW STOREROOM	1-61-1-A	AR
TRIM TANK	4-31-0-W	W
UPTAKE 1 (01 LEVEL)	01-145-0-TU	TU
UPTAKE 1 (02 LEVEL)	02-145-0-TU	TU
UPTAKE 1 (03 LEVEL)	03-145-0-TU	TU
UPTAKE 1 (04 LEVEL)	04-145-0-TU	TU
UPTAKE 1 (MAIN DECK LEVEL)	1-145-0-TU	TU
UPTAKE 1 (SECOND DECK LEVEL)	2-145-0-TU	TU
UPTAKE 2 (03 LEVEL)	03-162-0-TU	TU
UPTAKE 2 (04 LEVEL)	04-162-0-TU	TU
UPTAKE 2 (01 LEVEL)	01-162-0-TU	TU
UPTAKE 2 (02 LEVEL)	02-162-0-TU	TU
UPTAKE 2 (MAIN DECK LEVEL)	1-162-0-TU	TU
UPTAKE 2 (SECOND DECK LEVEL)	2-162-0-TU	TU
VENT TRUNK	1-326-0-Q	Q
VENT TRUNK	3-331-1-Q	Q
VESTIBULE (01 LEVEL)	01-295-1-Q	QS
VESTIBULE (MAIN DECK LEVEL)	1-295-1-Q	QS
VISITOR SR	02-120-6-L	L1
VOID SPACE	1-49-7-V	V
VOID SPACE	3-145-1-V	V
VOID SPACE	3-162-2-V	V
VOID SPACE	3-46-1-V	V
VOID SPACE	3-46-2-V	V
VOID SPACE	5-45-0-V	V
WARD BATH	1-162-5-LW	LW
WARD NO 1	1-162-7-L	L2
WARD NO 2	1-174-3-L	L2
WARDROOM & LOUNGE	01-100-0-LL	LL
WC & SHR	01-218-1-LW	LW
WC & SHR	01-218-2-LW	LW
WC & SHR	01-222-0-LW	LW
WC & SHR	01-239-1-LW	LW
WC & SHR	01-239-2-LW	LW
WC & SHR	01-255-1-LW	LW
WC & SHR	01-255-4-LW	LW
WC & SHR	01-255-5-LW	LW
WC & SHR	01-277-1-LW	LW
WC & SHR	01-277-3-LW	LW

WC & WR	1-213-1-LW	LW
WEIGHT ROOM & GYM	2-148-3-Q	Q
WET LAB	1-271-0-Q	QS
WET LAB NO.2	1-287-2-Q	QS
WINCH ROOM	2-311-0-Q	Q
WR & SHR	1-100-4-LW	LW
WR & WC	03-117-2-LW	LW
WR & WC	04-126-2-LW	LW
WR WC & SHR	01-106-2-LW	LW
WR WC & SHR	01-111-1-LW	LW
WR WC & SHR	01-117-2-LW	LW
WR WC & SHR	01-118-1-LW	LW
WR WC & SHR	01-125-2-LW	LW
WR WC & SHR	01-132-1-LW	LW
WR WC & SHR	01-146-1-LW	LW
WR WC & SHR	01-154-2-LW	LW
WR WC & SHR	01-162-4-LW	LW
WR WC & SHR	01-271-6-LW	LW
WR WC & SHR	01-278-2-LW	LW
WR WC & SHR	01-292-6-LW	LW
WR WC & SHR	01-298-2-LW	LW
WR WC & SHR	01-311-4-LW	LW
WR WC & SHR	02-113-2-LW	LW
WR WC & SHR	02-116-1-LW	LW
WR WC & SHR	02-120-4-LW	LW
WR WC & SHR	02-122-1-LW	LW
WR WC & SHR	02-132-2-LW	LW
WR WC & SHR	02-136-1-LW	LW
WR WC & SHR	02-136-2-LW	LW
WR WC & SHR	02-152-2-LW	LW
WR WC & SHR	02-154-1-LW	LW
WR WC & SHR	02-162-4-LW	LW
WR WC & SHR	02-171-1-LW	LW
WR WC & SHR	2-111-1-LW	LW
WR WC & SHR	2-111-2-LW	LW
WR WC & SHR	2-121-1-LW	LW
WR WC & SHR	2-121-2-LW	LW
WR WC & SHR	2-125-2-LW	LW
WR WC & SHR	2-281-1-LW	LW
WR WC & SHR	2-281-2-LW	LW
WR WC & SHR	2-284-1-LW	LW
WR WC & SHR	2-284-2-LW	LW
WR WC & SHR	2-291-1-LW	LW
WR WC & SHR	2-291-2-LW	LW
WR WC & SHR	2-295-1-LW	LW
WR WC & SHR	2-295-4-LW	LW
WTR WC & SHR	1-302-2-LW	LW
X-RAY DARKROOM	1-199-3-L	Q
XFMR VFCT [illegible]	01-255-8-A	AG

Total Compartments = 402

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APPENDIX B2

COMPARTMENT ID vs NAME
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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Compt ID	Use ID	Compartment Name
01-100-0-LL	LL	WARDROOM & LOUNGE
01-100-1-TS	TS	STAIRCASE
01-100-2-LP	LP	PASSAGE
01-100-3-L	L2	OFFICER SR
01-100-4-L	L2	CPO BERTHING
01-106-2-LW	LW	WR WC & SHR
01-111-1-LW	LW	WR WC & SHR
01-113-2-L	L2	CPO BERTHING
01-114-1-LP	LP	PASSAGE
01-117-2-LW	LW	WR WC & SHR
01-118-1-LW	LW	WR WC & SHR
01-118-3-L	L2	OFFICER SR
01-125-2-LW	LW	WR WC & SHR
01-125-4-L	L2	CPO BERTHING
01-126-1-Q	Q	OFFICER PANTRY
01-132-1-LW	LW	WR WC & SHR
01-138-3-L	L2	OFFICER SR
01-138-1-T	T	DUMB WAITER
01-142-2-L	L4	CPO BERTHING
01-145-0-TU	TU	UPTAKE 1
01-145-2-TS	TS	STAIRCASE
01-146-1-LW	LW	WR WC & SHR
01-146-3-L	L	OFFICER SR
01-153-1-A	AS	STOREROOM
01-154-2-LW	LW	WR WC & SHR
01-162-0-TU	TU	UPTAKE 2
01-162-1-TS	TS	STAIRCASE
01-162-2-LP	LP	PASSAGE
01-162-3-LP	LP	PASSAGE
01-162-4-LW	LW	WR WC & SHR
01-162-5-A	AG	ARCTIC GEAR LOCKER--OFFICER/CPO
01-162-6-L	L2	CPO BERTHING
01-178-0-W	W	ROLL STAB TANK CROSS DUCK
01-178-1-LP	LP	PASSAGE
01-178-2-W	W	ROLL STABILIZATION TANK
01-178-3-W	W	ROLL STABILIZATION TANK
01-218-1-LW	LW	WC & SHR
01-218-2-LW	LW	WC & SHR
01-218-3-A	AG	GEAR LOCKER
01-218-4-A	AG	GEAR LOCKER
01-218-5-LP	LP	PASSAGE
01-218-6-LP	LP	PASSAGE
01-218-8-A	AS	SCIENCE BAGGAGE ROOM
01-222-0-LW	LW	WC & SHR
01-222-1-L	L2	SCIENTIST SR
01-222-2-L	L2	SCIENTIST SR
01-225-0-L	L1	SCIENTIST SR
01-239-1-LW	LW	WC & SHR
01-239-2-LW	LW	WC & SHR
01-239-3-L	L2	SCIENTIST SR
01-239-4-L	L2	SCIENTIST SR
01-239-6-LP	LP	PASSAGE
01-239-8-A	QF	FAN ROOM

01-255-0-L	L2	SCIENTIST SR
01-255-1-LW	LW	WC & SHR
01-255-10-A	AS	STOREROOM
01-255-2-L	L2	SCIENTIST SR
01-255-3-L	L2	SCIENTIST SR
01-255-4-LW	LW	WC & SHR
01-255-5-LW	LW	WC & SHR
01-255-6-LP	LP	PASSAGE
01-255-8-A	AG	XFMR FECT HELO
01-261-2-TS	TS	STAIRCASE
01-271-1-L	L2	SCIENTIST SR
01-271-2-Q	QO	SCIENTIST LIBRARY/CONFERENCE ROOM
01-271-4-L	L2	SCIENTIST SR
01-271-6-LW	LW	WR WC & SHR
01-271-8-L	L2	SCIENTIST SR
01-277-1-LW	LW	WC & SHR
01-277-3-LW	LW	WC & SHR
01-277-5-L	L2	SCIENTIST SR
01-278-2-LW	LW	WR WC & SHR
01-292-2-LP	LP	PASSAGE
01-292-4-L	L2	SCIENTIST SR
01-292-6-LW	LW	WR WC & SHR
01-292-8-L	L2	SCIENTIST SR
01-295-1-Q	QS	VESTIBULE
01-298-2-LW	LW	WR WC & SHR
01-311-2-Q	Q	HOIST EQPT ROOM
01-311-4-LW	LW	WR WC & SHR
01-311-6-L	L2	SCIENTIST SR
01-312-2-Q	QS	SCIENTIST COMM CENTER
01-319-0-C	C	SCIENCE & WINCH CONTROL STATION
02-100-1-LL	LL	CO LOUNGE
02-100-2-L	L	CO CABIN
02-100-3-TS	TS	STAIRCASE
02-100-4-L	L1	CO SR
02-100-5-L	L1	CHIEF SCIENTIST SR
02-113-2-LW	LW	WR WC & SHR
02-115-1-LP	LP	PASSAGE
02-116-1-LW	LW	WR WC & SHR
02-120-2-L	L1	OFFICER SR
02-120-4-LW	LW	WR WC & SHR
02-120-6-L	L1	VISITOR SR
02-121-2-LP	LP	PASSAGE
02-122-1-LW	LW	WR WC & SHR
02-122-3-L	L1	OFFICER SR
02-129-1-Q	Q	PANTRY
02-132-2-LW	LW	WR WC & SHR
02-136-1-LW	LW	WR WC & SHR
02-136-2-LW	LW	WR WC & SHR
02-136-3-L	L1	OFFICER SR
02-136-4-L	L1	OFFICER SR
02-138-1-T	T	DUMB WAITER
02-145-0-TU	TU	UPTAKE 1
02-145-1-A	AS	STOREROOM
02-145-2-TS	TS	STAIRCASE
02-146-1-L	L1	OFFICER SR
02-148-2-L	L2	OFFICER SR
02-152-2-LW	LW	WR WC & SHR
02-154-1-LW	LW	WR WC & SHR
02-158-2-A	AG	GEAR LOCKER

02-162-0-TU	TU	UPTAKE 2
02-162-1-TS	TS	STAIRCASE
02-162-2-A	AS	STOREROOM
02-162-3-L	L2	OFFICER SR
02-162-4-LW	LW	WR WC & SHR
02-162-6-L	L2	OFFICER SR
02-171-1-LW	LW	WR WC & SHR
02-178-0-E	E	EMERGENCY/HARBOR GENERATOR ROOM
02-178-1-LP	LP	PASSAGE
02-178-2-W	W	ROLL STABILIZATION TANK
02-178-3-W	W	ROLL STABILIZATION TANK
02-218-0-QO	QO	HELO EQUIP ROOM & OFFICE
02-228-0-Q	Q	HANGAR
03-105-0-Q	Q	RADIO ROOM
03-105-1-A	Q	ELECTRONIC EQUIPMENT ROOM
03-106-2-A	Q	ELECTRONIC SHOP
03-111-2-LP	LP	PASSAGE
03-117-2-LW	LW	WR & WC
03-129-1-TS	TS	STAIRCASE
03-132-2-A	AS	ELECTRONIC STOREROOM
03-140-1-LP	LP	PASSAGE
03-145-0-TU	TU	UPTAKE 1
03-145-2-TS	TS	STAIRCASE
03-147-1-A	AS	STOREROOM
03-154-1-Q	Q	HAM SHACK
03-157-1-A	AS	STOREROOM
03-157-2-A	AG	GEAR LOCKER
03-162-0-TU	TU	UPTAKE 2
03-162-1-A	AG	GEAR LOCKER
03-162-2-Q	QF	FAN ROOM
03-162-3-Q	QF	FAN ROOM
03-165-1-TS	TS	STAIRCASE
03-178-2-E	E	AUXILIARY GENERATOR ROOM (UPPER LEVEL)
03-218-0-Q	QO	AVIATION OFFICE
03-228-0-Q	Q	HANGAR
04-108-0-C	C	PILOT HOUSE
04-126-0-Q	QO	METEROLOGY LAB & CHART ROOM
04-126-2-LW	LW	WR & WC
04-126-4-A	AG	GEAR LOCKER
04-132-2-L	L1	SEA CABIN
04-145-0-TU	TU	UPTAKE 1
04-162-0-TU	TU	UPTAKE 2
1-028-0-K	K	FLAMMABLE LIQUIDS STOREROOM
1-100-0-LP	LP	PASSAGE
1-100-1-TS	TS	STAIRCASE
1-100-2-LP	LP	PASSAGE
1-100-3-LP	LP	PASSAGE
1-100-4-LW	LW	WR & SHR
1-100-5-LL	LL	CREW MESS
1-100-6-Q	QO	SHIP LIBRARY
1-105-0-Q	Q	GALLEY
1-119-1-Q	Q	SCULLERY
1-124-2-LL	LL	CPO MESSROOM & LOUNGE
1-132-1-Q	Q	INCINERATOR ROOM
1-138-1-T	T	DUMB WAITER
1-145-0-TU	TU	UPTAKE 1
1-145-1-T	T	MACHINERY HOIST ROOM
1-145-2-TS	TS	STAIRCASE
1-154-1-A	AS	STOREROOM

1-162-0-TU	TU	UPTAKE 2
1-162-1-TS	TS	STAIRCASE
1-162-2-LP	LP	PASSAGE
1-162-3-LP	LP	PASSAGE
1-162-4-Q	Q	SHIP STORE
1-162-5-LW	LW	WARD BATH
1-162-6-A	AS	SHIP STORE STOREROOM
1-162-7-L	L2	WARD NO.1
1-169-2-T	T	MACHINERY HOIST ROOM
1-174-1-L	L	MEDICAL TREATMENT & EXAMINATION ROOM
1-174-3-L	L2	WARD NO.2
1-178-1-E	E	BOILER ROOM UPPER LEVEL
1-178-2-E	E	BOILER ROOM UPPER LEVEL
1-178-4-QO	QO	SUPPLY OFFICE
1-178-6-QO	QO	SUPPLY OFFICER OFFICE
1-187-2-QO	QO	1ST LT OFFICE
1-198-2-QO	QO	SHIP OFFICE
1-199-1-L	L	MEDICAL STORES
1-199-3-L	Q	X-RAY DARKROOM
1-206-2-QO	QO	EXO OFFICE
1-207-1-A	AS	STOREROOM
1-207-2-LP	LP	PASSAGE
1-207-3-A	AG	LIFE JACKET LOCKER
1-207-5-A	AG	BOAT GEAR LOCKER
1-210-0-M	M	SMALL ARMS STOW & REPAIR
1-210-1-Q	QO	BARBER SHOP
1-210-2-Q	QO	MAIL ROOM
1-210-3-A	AG	GEAR LOCKER
1-213-1-LW	LW	WC & WR
1-213-2-TS	TS	STAIRCASE
1-213-3-L	L	Q.M. SHELTER
1-217-2-A	AG	C.G. LOCKER
1-218-2-A	AG	C.G. LOCKER
1-22-0-Q	Q	ANCHOR WINDLASS MACHINERY ROOM
1-223-0-C	C	AFT REPAIR NO.3 & DAMAGE CONTROL WORKSHO
1-223-2-LP	LP	PASSAGE
1-223-4-A	AG	LIFE JACKET LOCKER
1-223-6-L	L	Q.M. SHELTER
1-233-2-A	AG	BOAT GEAR LOCKER
1-239-0-Q	QS	DRY LAB
1-239-1-LP	LP	PASSAGE
1-239-2-A	Q	PHOTO LAB
1-245-1-Q	Q	SCIENCE REEFER MACHY. ROOM
1-255-0-Q	Q	ELECTRONICS LAB
1-255-1-A	AR	REEFER
1-255-2-TS	TS	STAIRCASE
1-271-0-Q	QS	WET LAB
1-271-2-Q	Q	RECOMPRESSION AREA & DIVE GEAR LOCKER
1-278-2-TS	TS	STAIRCASE
1-287-2-Q	QS	WET LAB NO.2
1-295-1-Q	QS	VESTIBULE
1-302-2-LW	LW	WTR WC & SHR
1-307-2-A	AG	ARCTIC GEAR LOCKER--SCIENTIST
1-311-2-T	T	ELEVATOR
1-319-0-LP	LP	PASSAGE
1-326-0-Q	Q	VENT TRUNK
1-328-1-Q	QS	PORTABLE VAN
1-328-2-Q	QS	PORTABLE VAN
1-328-4-Q	QS	PORTABLE VAN

1-344-0-K	K	HAZARDOUS MATLS. ROOM
1-4-0-A	AS	STOREROOM
1-4- -Q	Q	BOW BOOM INSTRUMENT ROOM
1-49-0-Q	QF	FAN ROOM
1-49-1-LP	LP	PASSAGE
1-49-2-LP	LP	PASSAGE
1-49-3-A	AR	FROZEN STOREROOM NO.1
1-49-4-A	AS	STOREROOM
1-49-5-Q	Q	REEFER MACHINERY ROOM
1-49-7-V	V	VOID SPACE
1-52-0-LP	LP	PASSAGE
1-61-1-A	AR	THAW STOREROOM
1-61-3-A	AR	CHILL STOREROOM
1-64-2-A	AS	DRY PROVISION STOREROOM
1-81-1-A	AR	FROZEN STOREROOM NO.2
1-89-2-QO	QO	COMMISSARY OFFICE
1-89-4-A	AS	SODA STORAGE 1000 CASES
2-014-0-W	W	PEAK TANK
2-100-0-LP	LP	PASSAGE
2-100-1-L	L8	CREW BERTHING
2-100-2-L	L10	CREW BERTHING
2-100-3-A	AG	GEAR LOCKER
2-100-4-L	L10	CREW BERTHING
2-100-5-A	AG	STACK CHAIR LOCKER
2-105-1-TS	TS	STAIRCASE
2-111-1-LW	LW	WR WC & SHR
2-111-2-LW	LW	WR WC & SHR
2-121-1-LW	LW	WR WC & SHR
2-121-2-LW	LW	WR WC & SHR
2-121-3-L	L10	CREW BERTHING
2-121-4-L	L10	CREW BERTHING
2-125-2-LW	LW	WR WC & SHR
2-130-2-QO	QO	EXO OFFICE
2-134-1-LL	LL	CREW STUDY
2-145-0-TU	TU	UPTAKE 1
2-145-1-T	T	MACHINERY HOIST
2-145-2-TS	TS	STAIRCASE
2-146-2-Q	QO	ENGINEERING LOG & DAMAGE CONTROL CENTER
2-148-1-Q	AG	ATHLETIC GEAR LOCKER
2-148-3-Q	Q	WEIGHT ROOM & GYM
2-154-1-A	AS	STOREROOM
2-157-2-A	AG	GEAR LOCKER
2-162-0-TU	TU	UPTAKE 2
2-162-1-TS	TS	STAIRCASE
2-162-2-LP	LP	PASSAGE
2-162-3-LP	LP	PASSAGE
2-162-4-Q	Q	MACHINE SHOP
2-162-5-Q	Q	SHIP LAUNDRY
2-169-2-T	T	MACHINERY HOIST
2-178-1-E	E	BOILER ROOM
2-178-2-E	E	BOILER ROOM
2-180-1-Q	Q	SELF-SERVICE LAUNDRY
2-195-1-A	AS	ELECTRICAL STOREROOM
2-195-2-Q	Q	FIREFIGHTING EQPT ROOM
2-205-1-Q	Q	ELECTRIC SHOP
2-210-0-Q	Q	GRAVIMETER ROOM
2-210-01-Q	QO	COMPUTER/NAV LAB
2-210-2-TS	TS	STAIRCASE
2-22-0-A	AS	STOREROOM

2-223-0-C	C	ENGINEERING CONTROL CENTER
2-223-1-LP	LP	PASSAGE
2-223-2-LP	LP	PASSAGE
2-223-3-Q	Q	ELECTRICAL EQUIPMENT
2-223-4-Q	Q	ELECTRICAL EQUIPMENT ROOM NO.2
2-251-2-A	Q	BATTERY ROOM
2-256-1-TS	TS	STAIRCASE
2-256-2-TS	TS	STAIRCASE
2-262-1-Q	Q	IC/GYRO ROOM
2-262-2-QF	QF	FAN ROOM
2-271-1-L	L6	CREW BERTHING
2-271-2-L	L10	CREW BERTHING
2-271-3-LP	LP	PASSAGE
2-271-4-LP	LP	PASSAGE
2-271-5-L	L10	CREW BERTHING
2-271-6-L	L10	CREW BERTHING
2-275-2-TS	TS	STAIRCASE
2-279-1-TS	TS	STAIRCASE
2-281-1-LW	LW	WR WC & SHR
2-281-2-LW	LW	WR WC & SHR
2-284-1-LW	LW	WR WC & SHR
2-284-2-LW	LW	WR WC & SHR
2-291-1-LW	LW	WR WC & SHR
2-291-2-LW	LW	WR WC & SHR
2-291-3-L	L4	CREW BERTHING
2-291-4-L	L6	CREW BERTHING
2-295-1-LW	LW	WR WC & SHR
2-295-2-L	L6	CREW BERTHING
2-295-3-L	L6	CREW BERTHING
2-295-4-LW	LW	WR WC & SHR
2-311-0-Q	Q	WINCH ROOM
2-311-2-T	T	ELEVATOR
2-343-0-A	AS	HAWSER STORES & SCIENCE CARGO
2-343-2-A	AG	BOSN'S LOCKER
2-343-3-C	C	AFT REPAIR NO.2
2-361-1-E	E	STEERING GEAR ROOM
2-361-2-E	E	STEERING GEAR ROOM
2-388-1-A	AS	STOREROOM
2-388-2-A	AS	STOREROOM
2-4-0-A	AS	STOREROOM
2-49-0-AA	AA	SCIENCE STORAGE--UPPER CARGO HOLD
2-49-1-A	AG	SEA BAG LOCKER
2-61-1-M	M	SMALL ARMS & DEM MAG
2-65-1-Q	AS	ENGINEERING STOREROOM
2-65-2-C	C	FORWARD REPAIR NO.3
2-95-2-Q	Q	FWD IC/GYRO ROOM
3-100-0-E	E	ENGINE ROOM NO.1
3-100-1-F	F	OIL TANK
3-100-2-F	F	OIL TANK
3-12[illegible]-1-F	F	OIL TANK
3-12[illegible]-2-F	F	OIL TANK
3-145-1-V	V	VOID SPACE
3-145-2-F	F	OIL TANK
3-162-0-E	E	ENGINE ROOM NO.2
3-162-1-F	F	OIL TANK
3-162-2-V	V	VOID SPACE
3-178-1-F	F	OIL TANK
3-178-2-F	F	OIL TANK
3-199-1-F	F	OIL TANK

3-199-2-F	F	OIL TANK
3-22-0-A	AS	STOREROOM
3-223-0-E	E	MOTOR GENERATOR ROOM
3-223-1-F	F	OIL TANK
3-223-2-F	F	OIL TANK
3-247-1-F	F	OIL TANK
3-247-2-F	F	OIL TANK
3-271-0-E	E	AUXILIARY MACHINERY ROOM
3-311-0-AA	AA	SCIENCE STORAGE--AFT CARGO HOLD
3-311-2-T	T	ELEVATOR TRUNK
3-331-1-Q	Q	VENT TRUNK
3-4-0-A	AS	STOREROOM
3-46-1-V	V	VOID SPACE
3-46-2-V	V	VOID SPACE
3-49-0-AA	AA	CARGO HOLD
4-100-0-E	E	ENGINE ROOM NO.1
4-100-1-F	F	OIL TANK
4-100-2-F	F	OIL TANK
4-162-0-E	E	ENGINE ROOM NO.2
4-162-1-F	F	OIL TANK
4-162-2-F	F	OIL TANK
4-223-0-E	E	MOTOR ROOM
4-223-1-F	F	OIL TANK
4-223-2-F	F	OIL TANK
4-262-0-W	W	GREY/BLK WTR HOLDING TANK
4-271-0-E	E	PUMP ROOM
4-271-1-F	F	LUBE OIL
4-271-2-F	F	LUBE OIL
4-271-3-J	J	JP-5 STORAGE
4-271-4-J	J	JP-5 STORAGE
4-299-1-J	J	JP-5 SERVICE
4-299-2-J	J	JP-5 SERVICE
4-303-1-J	J	JP-5 STORAGE
4-303-2-J	J	JP-5 STORAGE
4-31-0-W	W	TRIM TANK
4-311-0-W	W	BILGE TANK
4-49-0-E	E	HYDRAULIC PUMP ROOM
4-49-1-F	F	OIL TANK
4-49-2-F	F	OIL TANK
4-76-1-F	F	OIL TANK
4-76-2-F	F	OIL TANK
5-100-0-E	E	ENGINE ROOM NO.1
5-100-1-F	F	OIL TANK
5-100-2-F	F	OIL TANK
5-162-0-E	E	ENGINE ROOM NO.2
5-162-1-F	F	OIL TANK
5-162-2-F	F	OIL TANK
5-223-0-E	E	MOTOR ROOM
5-223-1-F	F	OIL TANK
5-223-2-F	F	OIL TANK
5-271-0-F	F	OIL TANK
5-45-0-V	V	VOID SPACE
5-49-0-E	E	BOW THRUSTER MACHINERY ROOM
5-76-0-E	E	BOW THRUSTER MACHINERY ROOM
5-76-1-F	F	OIL TANK
5-76-2-F	F	OIL TANK
8-100-7-LL	LL	CREW LOUNGE

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APPENDIX B3

COMPARTMENT ID vs NAME
sorted by USE ID
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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Compt ID	Compartment Name
Use ID: AA	
2-49-0-AA	SCIENCE STORAGE--UPPER CARGO HOLD
3-311-0-AA	SCIENCE STORAGE--AFT CARGO HOLD
3-49-0-AA	CARGO HOLD
Use ID: AG	
01-162-5-A	ARCTIC GEAR LOCKER--OFFICER/CPO
01-218-3-A	GEAR LOCKER
01-218-4-A	GEAR LOCKER
01-255-8-A	XFMR FECT HELO
02-158-2-A	GEAR LOCKER
03-157-2-A	GEAR LOCKER
03-162-1-A	GEAR LOCKER
04-126-4-A	GEAR LOCKER
1-207-3-A	LIFE JACKET LOCKER
1-207-5-A	BOAT GEAR LOCKER
1-210-3-A	GEAR LOCKER
1-217-2-A	C.G. LOCKER
1-218-2-A	C.G. LOCKER
1-223-4-A	LIFE JACKET LOCKER
1-233-2-A	BOAT GEAR LOCKER
1-307-2-A	ARCTIC GEAR LOCKER--SCIENTIST
2-100-3-A	GEAR LOCKER
2-100-5-A	STACK CHAIR LOCKER
2-148-1-Q	ATHLETIC GEAR LOCKER
2-157-2-A	GEAR LOCKER
2-343-2-A	BOSN'S LOCKER
2-49-1-A	SEA BAG LOCKER
Use ID: AR	
1-255-1-A	REEFER
1-49-3-A	FROZEN STOREROOM NO.1
1-61-1-A	THAW STOREROOM
1-61-3-A	CHILL STOREROOM
1-81-1-A	FROZEN STOREROOM NO.2
Use ID: AS	
01-153-1-A	STOREROOM
01-218-8-A	SCIENCE BAGGAGE ROOM
01-255-10-A	STOREROOM
02-145-1-A	STOREROOM
02-162-2-A	STOREROOM
03-132-2-A	ELECTRONIC STOREROOM
03-147-1-A	STOREROOM
03-157-1-A	STOREROOM
1-154-1-A	STOREROOM
1-162-6-A	SHIP STORE STOREROOM

1-287-1-A	STOREROOM
1-4-0-A	STOREROOM
1-49-4-A	STOREROOM
1-64-2-A	DRY PROVISION STOREROOM
1-89-4-A	SODA STORAGE 1000 CASES
2-154-1-A	STOREROOM
2-195-1-A	ELECTRICAL STOREROOM
2-22-0-A	STOREROOM
2-343-0-A	HAWSER STORES & SCIENCE CARGO
2-388-1-A	STOREROOM
2-388-2-A	STOREROOM
2-4-0-A	STOREROOM
2-65-1-Q	ENGINEERING STOREROOM
3-22-0-A	STOREROOM
3-4-0-A	STOREROOM

Use ID: C

01-319-0-C	SCIENCE & WINCH CONTROL STATION
04-108-0-C	PILOT HOUSE
1-223-0-C	AFT REPAIR NO.3 & DAMAGE CONTROL WORKSHO
2-223-0-C	ENGINEERING CONTROL CENTER
2-343-3-C	AFT REPAIR NO.2
2-65-2-C	FORWARD REPAIR NO.3

Use ID: E

02-178-0-E	EMERGENCY/HARBOR GENERATOR ROOM
03-178-2-E	AUXILIARY GENERATOR ROOM (UPPER LEVEL)
1-178-1-E	BOILER ROOM UPPER LEVEL
1-178-2-E	BOILER ROOM UPPER LEVEL
2-178-1-E	BOILER ROOM
2-178-2-E	BOILER ROOM
2-361-1-E	STEERING GEAR ROOM
2-361-2-E	STEERING GEAR ROOM
3-100-0-E	ENGINE ROOM NO.1
3-162-0-E	ENGINE ROOM NO.2
3-223-0-E	MOTOR GENERATOR ROOM
3-271 0-E	AUXILIARY MACHINERY ROOM
4-100-0-E	ENGINE ROOM NO.1
4-162-0-E	ENGINE ROOM NO.2
4-223-0-E	MOTOR ROOM
4-271-0-E	PUMP ROOM
4-49-0-E	HYDRAULIC PUMP ROOM
5-100-0-E	ENGINE ROOM NO.1
5-162-0-E	ENGINE ROOM NO.2
5-223-0-E	MOTOR ROOM
5-49-0-E	BOW THRUSTER MACHINERY ROOM
5-76-0-E	BOW THRUSTER MACHINERY ROOM

Use ID: F

3-100-1-F	OIL TANK
3-100-2-F	OIL TANK
3-127-1-F	OIL TANK
3-127-2-F	OIL TANK
3-145-2-F	OIL TANK
3-162-1-F	OIL TANK
3-178-1-F	OIL TANK
3-178-2-F	OIL TANK
3-199-1-F	OIL TANK

3-199-2-F	OIL TANK
3-223-1-F	OIL TANK
3-223-2-F	OIL TANK
3-247-1-F	OIL TANK
3-247-2-F	OIL TANK
4-100-1-F	OIL TANK
4-100-2-F	OIL TANK
4-162-1-F	OIL TANK
4-162-2-F	OIL TANK
4-223-1-F	OIL TANK
4-223-2-F	OIL TANK
4-271-1-F	LUBE OIL
4-271-2-F	LUBE OIL
4-49-1-F	OIL TANK
4-49-2-F	OIL TANK
4-76-1-F	OIL TANK
4-76-2-F	OIL TANK
5-100-1-F	OIL TANK
5-100-2-F	OIL TANK
5-162-1-F	OIL TANK
5-162-2-F	OIL TANK
5-223-1-F	OIL TANK
5-223-2-F	OIL TANK
5-271-0-F	OIL TANK
5-76-1-F	OIL TANK
5-76-2-F	OIL TANK

Use ID: J

4-271-3-J	JP-5 STORAGE
4-271-4-J	JP-5 STORAGE
4-299-1-J	JP-5 SERVICE
4-299-2-J	JP-5 SERVICE
4-303-1-J	JP-5 STORAGE
4-303-2-J	JP-5 STORAGE

Use ID: K

1-028-0-K	FLAMMABLE LIQUIDS STOREROOM
1-344-0-K	HAZARDOUS MATLS. ROOM

Use ID: L

01-146-3-L	OFFICER SR
02-100-2-L	CO CABIN
1-174-1-L	MEDICAL TREATMENT & EXAMINATION ROOM
1-199-1-L	MEDICAL STORES
1-213-3-L	Q.M. SHELTER
1-223-6-L	Q.M. SHELTER

Use ID: L1

01-225-0-L	SCIENTIST SR
02-100-4-L	CO SR
02-100-5-L	CHIEF SCIENTIST SR
02-120-2-L	OFFICER SR
02-120-6-L	VISITOR SR
02-122-3-L	OFFICER SR
02-136-3-L	OFFICER SR
02-136-4-L	OFFICER SR
02-146-1-L	OFFICER SR

04-132-2-L	SFA CABIN

Use ID: L10

2-100-2-L	CREW BERTHING
2-100-4-L	CREW BERTHING
2-121-3-L	CREW BERTHING
2-121-4-L	CREW BERTHING
2-271-2-L	CREW BERTHING
2-271-5-L	CREW BERTHING
2-271-6-L	CREW BERTHING

Use ID: L2

01-100-3-L	OFFICER SR
01-100-4-L	CPO BERTHING
01-113-2-L	CPO BERTHING
01-119-3-L	OFFICER SR
01-125-4-L	CPO BERTHING
01-132-3-L	OFFICER SR
01-162-6-L	CPO BERTHING
01-222-1-L	SCIENTIST SR
01-222-2-L	SCIENTIST SR
01-239-3-L	SCIENTIST SR
01-239-4-L	SCIENTIST SR
01-255-0-L	SCIENTIST SR
01-255-2-L	SCIENTIST SR
01-255-3-L	SCIENTIST SR
01-271-1-L	SCIENTIST SR
01-271-4-L	SCIENTIST SR
01-271-8-L	SCIENTIST SR
01-277-5-L	SCIENTIST SR
01-292-4-L	SCIENTIST SR
01-292-8-L	SCIENTIST SR
01-311-6-L	SCIENTIST SR
02-148-2-L	OFFICER SR
02-162-3-L	OFFICER SR
02-162-6-L	OFFICER SR
1-162-7-L	WARD NO.1
1-174-3-L	WARD NO.2

Use ID: L4

01-142-2-L	CPO BERTHING
2-291-3-L	CREW BERTHING

Use ID: L6

2-271-1-L	CREW BERTHING
2-291-4-L	CREW BERTHING
2-295-2-L	CREW BERTHING
2-295-3-L	CREW BERTHING

Use ID: L8

2-100-1-L	CREW BERTHING

Use ID: LL

01-100-0-LL	WARDROOM & LOUNGE
02-100-1-LL	CO LOUNGE

1-100-5-LL	CREW MESS
1-124-2-LL	CPO MESSROOM & LOUNGE
2-100-7-LL	CREW LOUNGE
2-134-1-LL	CREW STUDY

Use ID: LP

01-100-2-LP	PASSAGE
01-114-1-LP	PASSAGE
01-162-2-LP	PASSAGE
01-162-3-LP	PASSAGE
01-178-1-LP	PASSAGE
01-218-5-LP	PASSAGE
01-218-6-LP	PASSAGE
01-239-6-LP	PASSAGE
01-255-6-LP	PASSAGE
01-292-2-LP	PASSAGE
02-115-1-LP	PASSAGE
02-121-2-LP	PASSAGE
02-178-1-LP	PASSAGE
03-111-2-LP	PASSAGE
03-140-1-LP	PASSAGE
1-100-0-LP	PASSAGE
1-100-2-LP	PASSAGE
1-100-3-LP	PASSAGE
1-162-2-LP	PASSAGE
1-162-3-LP	PASSAGE
1-207-2-LP	PASSAGE
1-223-2-LP	PASSAGE
1-239-1-LP	PASSAGE
1-319-0-LP	PASSAGE
1-49-1-LP	PASSAGE
1-49-2-LP	PASSAGE
1-52-0-LP	PASSAGE
2-100-0-LP	PASSAGE
2-162-2-LP	PASSAGE
2-162-3-LP	PASSAGE
2-223-1-LP	PASSAGE
2-223-2-LP	PASSAGE
2-271-3-LP	PASSAGE
2-271-4-LP	PASSAGE

Use ID: LW

01-106-2-LW	WR WC & SHR
01-111-1-LW	WR WC & SHR
01-117-2-LW	WR WC & SHR
01-118-1-LW	WR WC & SHR
01-125-2-LW	WR WC & SHR
01-132-1-LW	WR WC & SHR
01-146-1-LW	WR WC & SHR
01-154-2-LW	WR WC & SHR
01-162-4-LW	WR WC & SHR
01-218-1-LW	WC & SHR
01-218-2-LW	WC & SHR
01-222-0-LW	WC & SHR
01-239-1-LW	WC & SHR
01-239-2-LW	WC & SHR
01-255-1-LW	WC & SHR
01-255-4-LW	WC & SHR
01-255-5-LW	WC & SHR

01-277-6-LW	WR WC & SHR
01-277-1-LW	WC & SHR
01-277-3-LW	WC & SHR
01-278-2-LW	WR WC & SHR
01-292-6-LW	WR WC & SHR
01-298-2-LW	WR WC & SHR
01-311-4-LW	WR WC & SHR
02-113-2-LW	WR WC & SHR
02-116-1-LW	WR WC & SHR
02-120-4-LW	WR WC & SHR
02-122-1-LW	WR WC & SHR
02-132-2-LW	WR WC & SHR
02-136-1-LW	WR WC & SHR
02-136-2-LW	WR WC & SHR
02-152-2-LW	WR WC & SHR
02-154-1-LW	WR WC & SHR
02-162-4-LW	WR WC & SHR
02-171-1-LW	WR WC & SHR
03-117-2-LW	WR & WC
04-126-2-LW	WR & WC
1-100-4-LW	WR & SHR
1-162-5-LW	WARD BATH
1-213-1-LW	WC & WR
1-302-2-LW	WTR WC & SHR
2-111-1-LW	WR WC & SHR
2-111-2-LW	WR WC & SHR
2-121-1-LW	WR WC & SHR
2-121-2-LW	WR WC & SHR
2-125-2-LW	WR WC & SHR
2-281-1-LW	WR WC & SHR
2-281-2-LW	WR WC & SHR
2-284-1-LW	WR WC & SHR
2-284-2-LW	WR WC & SHR
2-291-1-LW	WR WC & SHR
2-291-2-LW	WR WC & SHR
2-295-1-LW	WR WC & SHR
2-295-4-LW	WR WC & SHR

Use ID: M

1-210-0-M	SMALL ARMS STOW & REPAIR
2-61-1-M	SMALL ARMS & DEM MAG

Use ID: Q

01-126-1-Q	OFFICER PANTRY
01-311-2-Q	HOIST EQPT ROOM
02-129-1-Q	PANTRY
02-228-0-Q	HANGAR
03-105-0-Q	RADIO ROOM
03-105-1-A	ELECTRONIC EQUIPMENT ROOM
03-106-2-A	ELECTRONIC SHOP
03-154-1-Q	HAM SHACK
03-228-0-Q	HANGAR
1-105-0-Q	GALLEY
1-119-1-Q	SCULLERY
1-132-1-Q	INCINERATOR ROOM
1-162-4-Q	SHIP STORE
1-199-3-L	X-RAY DARKROOM
1-22-0-Q	ANCHOR WINDLASS MACHINERY ROOM
1-239-2-A	PHOTO LAB

1-245-1-Q	SCIENCE REEFER MACHY. ROOM
1-255-0-Q	ELECTRONICS LAB
1-271-2-Q	RECOMPRESSION AREA & DIVE GEAR LOCKER
1-326-0-Q	VENT TRUNK
1-4-2-Q	BOW BOOM INSTRUMENT ROOM
1-49-5-Q	REEFER MACHINERY ROOM
2-148-3-Q	WEIGHT ROOM & GYM
2-162-4-Q	MACHINE SHOP
2-162-5-Q	SHIP LAUNDRY
2-180-1-Q	SELF-SERVICE LAUNDRY
2-195-2-Q	FIREFIGHTING EQPT ROOM
2-205-1-Q	ELECTRIC SHOP
2-210-0-Q	GRAVIMETER ROOM
2-223-3-Q	ELECTRICAL EQUIPMENT
2-223-4-Q	ELECTRICAL EQUIPMENT ROOM NO.2
2-251-2-A	BATTERY ROOM
2-262-1-Q	IC/GYRO ROOM
2-311-0-Q	WINCH ROOM
2-95-2-Q	FWD IC/GYRO ROOM
3-331-1-Q	VENT TRUNK

Use ID: QF

01-239-8-A	FAN ROOM
03-162-2-Q	FAN ROOM
03-162-3-Q	FAN ROOM
1-49-0-Q	FAN ROOM
2-262-2-QF	FAN ROOM

Use ID: QO

01-271-2-Q	SCIENTIST LIBRARY/CONFERENCE ROOM
02-218-0-QO	HELO EQUIP ROOM & OFFICE
03-218-0-Q	AVIATION OFFICE
04-126-0-Q	METEROLOGY LAB & CHART ROOM
1-100-6-Q	SHIP LIBRARY
1-178-4-QO	SUPPLY OFFICE
1-178-6-QO	SUPPLY OFFICER OFFICE
1-187-2-QO	1ST LT OFFICE
1-198-2-QO	SHIP OFFICE
1-206-2-QO	EXO OFFICE
1-210-1-Q	BARBER SHOP
1-210-2-Q	MAIL ROOM
1-89-2-QO	COMMISSARY OFFICE
2-130-2-QO	EXO OFFICE
2-146-2-Q	ENGINEERING LOG & DAMAGE CONTROL CENTER
2-210-01-Q	COMPUTER/NAV LAB

Use ID: QS

01-295-1-Q	VESTIBULE
01-312-2-Q	SCIENTIST COMM CENTER
1-239-0-Q	DRY LAB
1-271-0-Q	WET LAB
1-287-2-Q	WET LAB NO.2
1-295-1-Q	VESTIBULE
1-328-1-Q	PORTABLE VAN
1-328-2-Q	PORTABLE VAN
1-328-4-Q	PORTABLE VAN

Use ID: T

01-138-1-T	DUMB WAITER
02-138-1-T	DUMB WAITER
1-138-1-T	DUMB WAITER
1-145-1-T	MACHINERY HOIST ROOM
1-169-2-T	MACHINERY HOIST ROOM
1-311-2-T	ELEVATOR
2-145-1-T	MACHINERY HOIST
2-169-2-T	MACHINERY HOIST
2-311-2-T	ELEVATOR
3-311-2-T	ELEVATOR TRUNK

Use ID: TS

01-100-1-TS	STAIRCASE
01-145-2-TS	STAIRCASE
01-162-1-TS	STAIRCASE
01-261-2-TS	STAIRCASE
02-100-3-TS	STAIRCASE
02-145-2-TS	STAIRCASE
02-162-1-TS	STAIRCASE
03-129-1-TS	STAIRCASE
03-145-2-TS	STAIRCASE
03-165-1-TS	STAIRCASE
1-100-1-TS	STAIRCASE
1-145-2-TS	STAIRCASE
1-162-1-TS	STAIRCASE
1-213-2-TS	STAIRCASE
1-255-2-TS	STAIRCASE
1-278-2-TS	STAIRCASE
2-105-1-TS	STAIRCASE
2-145-2-TS	STAIRCASE
2-162-1-TS	STAIRCASE
2-210-2-TS	STAIRCASE
2-256-1-TS	STAIRCASE
2-256-2-TS	STAIRCASE
2-275-2-TS	STAIRCASE
2-279-1-TS	STAIRCASE

Use ID: TU

01-145-0-TU	UPTAKE 1
01-162-0-TU	UPTAKE 2
02-145-0-TU	UPTAKE 1
02-162-0-TU	UPTAKE 2
03-145-0-TU	UPTAKE 1
03-162-0-TU	UPTAKE 2
04-145-0-TU	UPTAKE 1
04-162-0-TU	UPTAKE 2
1-145-0-TU	UPTAKE 1
1-162-0-TU	UPTAKE 2
2-145-0-TU	UPTAKE 1
2-162-0-TU	UPTAKE 2

Use ID: U

1-49-2-U	VOID SPACE
3-145-1-U	VOID SPACE
3-162-2-U	VOID SPACE
3-46-1-U	VOID SPACE

3-46-2-U	VOID SPACE
5-45-0-U	VOID SPACE

Use ID: W

01-178-0-W	ROLL STAB TANK CROSS DUCK
01-178-2-W	ROLL STABILIZATION TANK
01-178-3-W	ROLL STABILIZATION TANK
02-178-2-W	ROLL STABILIZATION TANK
02-178-3-W	ROLL STABILIZATION TANK
2-014-0-W	PEAK TANK
4-262-0-W	GREY/BLK WTR HOLDING TANK
4-31-0-W	TRIM TANK
4-311-0-W	BILGE TANK

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APPENDIX C

Compartment Hierarchy for PIR

Appendix C lists all compartments ordered in a hierarchy composed of the frequency of unacceptable loss multiplied by an unacceptable loss rating. Within each hierarchical group, compartments are ordered numerically by compartment number.

Glossary:

Uloss - A rating assigned to each compartment assessing the magnitude of the fire loss needed to cause loss of ship mission capabilities. Assigned values range from 1 (where a fire simply reaching Established Burning in the compartment would threaten mission performance) to 8 (where all compartments of one type lost to fire would be considered unacceptable.)

Frequency uloss - The threshold frequency of the unacceptable loss. It is expressed as the number of times the compartment can be lost per ship year.

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COMPARTMENT HIERARCHY
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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uloss * freq_uloss	Plan ID	Compartment Name
0.0330	1-028-0-K	FLAMMABLE LIQUIDS STOREROOM
0.0330	1-344-0-K	HAZARDOUS MATLS. ROOM
0.0660	2-223-0-C	ENGINEERING CONTROL CENTER
0.0660	2-223-3-Q	ELECTRICAL EQUIPMENT
0.0660	2-223-4-Q	ELECTRICAL EQUIPMENT ROOM NO.2
0.0660	2-361-1-E	STEERING GEAR ROOM
0.0660	2-361-2-E	STEERING GEAR ROOM
0.0660	3-223-0-E	MOTOR GENERATOR ROOM
0.0660	4-223-0-E	MOTOR ROOM
0.0660	4-271-0-E	PUMP ROOM
0.0660	5-223-0-E	MOTOR ROOM
0.0990	04-108-0-C	PILOT HOUSE
0.0990	04-126-0-Q	METEROLOGY LAB & CHART ROOM
0.0990	1-255-1-A	REEFER .
0.0990	1-49-3-A	FROZEN STOREROOM NO.1
0.0990	1-61-1-A	THAW STOREROOM
0.0990	1-61-3-A	CHILL STOREROOM
0.0990	1-81-1-A	FROZEN STOREROOM NO.2
0.0990	3-100-0-E	ENGINE ROOM NO.1
0.0990	3-162-0-E	ENGINE ROOM NO.2
0.0990	4-100-0-E	ENGINE ROOM NO.1
0.0990	4-162-0-E	ENGINE ROOM NO.2
0.0990	5-100-0-E	ENGINE ROOM NO.1
0.0990	5-162-0-E	ENGINE ROOM NO.2
0.1000	03-105-1-A	ELECTRONIC EQUIPMENT ROOM
0.1320	1-178-1-E	BOILER ROOM UPPER LEVEL
0.1320	1-178-2-E	BOILER ROOM UPPER LEVEL
0.1320	2-178-1-E	BOILER ROOM
0.1320	2-178-2-E	BOILER ROOM
0.2000	02-228-0-Q	HANGAR
0.2000	03-105-0-Q	RADIO ROOM
0.2000	03-106-2-A	ELECTRONIC SHOP
0.2000	03-228-0-Q	HANGAR
0.2000	1-245-1-Q	SCIENCE REEFER MACHY. ROOM
0.2000	1-49-5-Q	REEFER MACHINERY ROOM
0.2000	2-195-1-A	ELECTRICAL STOREROOM
0.2000	2-262-1-Q	IC/GYRO ROOM
0.2640	02-178-0-E	EMERGENCY/HARBOR GENERATOR ROOM
0.2640	03-178-2-E	AUXILIARY GENERATOR ROOM (UPPER LEVEL)
0.2640	4-49-0-E	HYDRAULIC PUMP ROOM
0.3000	01-295-1-Q	VESTIBULE
0.3000	01-319-0-C	SCIENCE & WINCH CONTROL STATION
0.3000	03-162-2-Q	FAN ROOM
0.3000	03-162-3-Q	FAN ROOM
0.3000	03-218-0-Q	AVIATION OFFICE
0.3000	1-105-0-Q	GALLEY
0.3000	1-207-1-A	STOREROOM

0.3000	1-22-0-Q	ANCHOR WINDLASS MACHINERY ROOM
0.3000	1-239-0-Q	DRY LAB
0.3000	1-255-0-Q	ELECTRONICS LAB
0.3000	1-271-0-Q	WET LAB
0.3000	1-287-2-Q	WET LAB NO.2
0.3000	1-295-1-Q	VESTIBULE
0.3000	1-328-1-Q	PORTABLE VAN
0.3000	1-328-2-Q	PORTABLE VAN
0.3000	1-328-4-Q	PORTABLE VAN
0.3000	1-4-2-Q	BOW BOOM INSTRUMENT ROOM
0.3000	1-64-2-A	DRY PROVISION STOREROOM
0.3000	2-195-2-Q	FIREFIGHTING EQPT ROOM
0.3000	2-210-0-Q	GRAVIMETER ROOM
0.3000	2-210-01-Q	COMPUTER/NAV LAB
0.3000	2-262-2-QF	FAN ROOM
0.3000	2-311-0-Q	WINCH ROOM
0.3000	2-49-0-AA	SCIENCE STORAGE--UPPER CARGO HOLD
0.3000	3-271-0-E	AUXILIARY MACHINERY ROOM
0.3000	3-311-0-AA	SCIENCE STORAGE--AFT CARGO HOLD
0.3000	3-49-0-AA	CARGO HOLD
0.4000	01-100-0-LL	WARDROOM & LOUNGE
0.4000	02-100-1-LL	CO LOUNGE
0.4000	1-100-5-LL	CREW MESS
0.4000	1-124-2-LL	CPO MESSROOM & LOUNGE
0.4000	2-100-7-LL	CREW LOUNGE
0.4000	2-134-1-LL	CREW STUDY
0.6600	02-218-0-QO	HELO EQUIP ROOM & OFFICE
0.6600	1-271-2-Q	RECOMPRESSION AREA & DIVE GEAR LOCKER
0.7000	01-100-3-L	OFFICER SR
0.7000	01-100-4-L	CPO BERTHING
0.7000	01-113-2-L	CPO BERTHING
0.7000	01-118-3-L	OFFICER SR
0.7000	01-125-4-L	CPO BERTHING
0.7000	01-132-3-L	OFFICER SR
0.7000	01-142-2-L	CPO BERTHING
0.7000	01-162-6-L	CPO BERTHING
0.7000	01-222-1-L	SCIENTIST SR
0.7000	01-222-2-L	SCIENTIST SR
0.7000	01-225-0-L	SCIENTIST SR
0.7000	01-239-3-L	SCIENTIST SR
0.7000	01-239-4-L	SCIENTIST SR
0.7000	01-255-0-L	SCIENTIST SR
0.7000	01-255-2-L	SCIENTIST SR
0.7000	01-255-3-L	SCIENTIST SR
0.7000	01-271-1-L	SCIENTIST SR
0.7000	01-271-4-L	SCIENTIST SR
0.7000	01-271-8-L	SCIENTIST SR
0.7000	01-277-5-L	SCIENTIST SR
0.7000	01-292-4-L	SCIENTIST SR
0.7000	01-292-8-L	SCIENTIST SR
0.7000	01-311-6-L	SCIENTIST SR

0.7000	02-100-2-L	CO CABIN
0.7000	02-100-4-L	CO SR
0.7000	02-100-5-L	CHIEF SCIENTIST SR
0.7000	02-120-2-L	OFFICER SR
0.7000	02-120-6-L	VISITOR SR
0.7000	02-122-3-L	OFFICER SR
0.7000	02-136-3-L	OFFICER SR
0.7000	02-136-4-L	OFFICER SR
0.7000	02-146-1-L	OFFICER SR
0.7000	02-148-2-L	OFFICER SR
0.7000	02-162-3-L	OFFICER SR
0.7000	02-162-6-L	OFFICER SR
0.7000	04-132-2-L	SEA CABIN
0.7000	1-162-7-L	WARD NO.1
0.7000	1-174-3-L	WARD NO.2
0.7000	2-100-1-L	CREW BERTHING
0.7000	2-100-2-L	CREW BERTHING
0.7000	2-100-4-L	CREW BERTHING
0.7000	2-121-3-L	CREW BERTHING
0.7000	2-121-4-L	CREW BERTHING
0.7000	2-271-1-L	CREW BERTHING
0.7000	2-271-2-L	CREW BERTHING
0.7000	2-271-5-L	CREW BERTHING
0.7000	2-271-6-L	CREW BERTHING
0.7000	2-291-3-L	CREW BERTHING
0.7000	2-291-4-L	CREW BERTHING
0.7000	2-295-2-L	CREW BERTHING
0.7000	2-295-3-L	CREW BERTHING
0.8000	01-100-1-TS	STAIRCASE
0.8000	01-100-2-LP	PASSAGE
0.8000	01-106-2-LW	WR WC & SHR
0.8000	01-111-1-LW	WR WC & SHR
0.8000	01-114-1-LP	PASSAGE
0.8000	01-117-2-LW	WR WC & SHR
0.8000	01-118-1-LW	WR WC & SHR
0.8000	01-125-2-LW	WR WC & SHR
0.8000	01-132-1-LW	WR WC & SHR
0.8000	01-145-2-TS	STAIRCASE
0.8000	01-146-1-LW	WR WC & SHR
0.8000	01-154-2-LW	WR WC & SHR
0.8000	01-162-1-TS	STAIRCASE
0.8000	01-162-2-LP	PASSAGE
0.8000	01-162-3-LP	PASSAGE
0.8000	01-162-4-LW	WR WC & SHR
0.8000	01-178-1-LP	PASSAGE
0.8000	01-218-1-LW	WC & SHR
0.8000	01-218-2-LW	WC & SHR
0.8000	01-218-5-LP	PASSAGE
0.8000	01-218-6-LP	PASSAGE
0.8000	01-222-0-LW	WC & SHR
0.8000	01-239-1-LW	WC & SHR

0.8000	01-239-2-LW	WC & SHR
0.8000	01-239-6-LP	PASSAGE
0.8000	01-255-1-LW	WC & SHR
0.8000	01-255-4-LW	WC & SHR
0.8000	01-255-5-LW	WC & SHR
0.8000	01-255-6-LP	PASSAGE
0.8000	01-261-2-TS	STAIRCASE
0.8000	01-271-6-LW	WR WC & SHR
0.8000	01-277-1-LW	WC & SHR
0.8000	01-277-3-LW	WC & SHR
0.8000	01-278-2-LW	WR WC & SHR
0.8000	01-292-2-LP	PASSAGE
0.8000	01-292-6-LW	WR WC & SHR
0.8000	01-298-2-LW	WR WC & SHR
0.8000	01-311-4-LW	WR WC & SHR
0.8000	02-100-3-TS	STAIRCASE
0.8000	02-113-2-LW	WR WC & SHR
0.8000	02-115-1-LP	PASSAGE.
0.8000	02-116-1-LW	WR WC & SHR
0.8000	02-120-4-LW	WR WC & SHR
0.8000	02-121-2-LP	PASSAGE
0.8000	02-122-1-LW	WR WC & SHR
0.8000	02-132-2-LW	WR WC & SHR
0.8000	02-136-1-LW	WR WC & SHR
0.8000	02-136-2-LW	WR WC & SHR
0.8000	02-145-2-TS	STAIRCASE
0.8000	02-152-2-LW	WR WC & SHR
0.8000	02-154-1-LW	WR WC & SHR
0.8000	02-162-1-TS	STAIRCASE
0.8000	02-162-4-LW	WR WC & SHR
0.8000	02-171-1-LW	WR WC & SHR
0.8000	02-178-1-LP	PASSAGE
0.8000	03-111-2-LP	PASSAGE
0.8000	03-117-2-LW	WR & WC
0.8000	03-129-1-TS	STAIRCASE
0.8000	03-140-1-LP	PASSAGE
0.8000	03-145-2-TS	STAIRCASE
0.8000	03-147-1-A	STOREROOM
0.8000	03-165-1-TS	STAIRCASE
0.8000	04-126-2-LW	WR & WC
0.8000	1-100-0-LP	PASSAGE
0.8000	1-100-1-TS	STAIRCASE
0.8000	1-100-2-LP	PASSAGE
0.8000	1-100-3-LP	PASSAGE
0.8000	1-100-4-LW	WR & SHR
0.8000	1-119-1-Q	SCULLERY
0.8000	1-132-1-Q	INCINERATOR ROOM
0.8000	1-145-2-TS	STAIRCASE
0.8000	1-162-1-TS	STAIRCASE
0.8000	1-162-2-LP	PASSAGE
0.8000	1-162-3-LP	PASSAGE

0.8000	1-162-5-LW	WARD BATH
0.8000	1-207-2-LP	PASSAGE
0.8000	1-213-1-LW	WC & WR
0.8000	1-213-2-TS	STAIRCASE
0.8000	1-223-2-LP	PASSAGE
0.8000	1-239-1-LP	PASSAGE
0.8000	1-255-2-TS	STAIRCASE
0.8000	1-278-2-TS	STAIRCASE
0.8000	1-302-2-LW	WTR WC & SHR
0.8000	1-319-0-LP	PASSAGE
0.8000	1-49-1-LP	PASSAGE
0.8000	1-49-2-LP	PASSAGE
0.8000	1-52-0-LP	PASSAGE
0.8000	2-100-0-LP	PASSAGE
0.8000	2-105-1-TS	STAIRCASE
0.8000	2-111-1-LW	WR WC & SHR
0.8000	2-111-2-LW	WR WC & SHR
0.8000	2-121-1-LW	WR WC & SHR
0.8000	2-121-2-LW	WR WC & SHR
0.8000	2-125-2-LW	WR WC & SHR
0.8000	2-145-2-TS	STAIRCASE
0.8000	2-162-1-TS	STAIRCASE
0.8000	2-162-2-LP	PASSAGE
0.8000	2-162-3-LP	PASSAGE
0.8000	2-210-2-TS	STAIRCASE
0.8000	2-223-1-LP	PASSAGE
0.8000	2-223-2-LP	PASSAGE
0.8000	2-256-1-TS	STAIRCASE
0.8000	2-256-2-TS	STAIRCASE
0.8000	2-271-3-LP	PASSAGE
0.8000	2-271-4-LP	PASSAGE
0.8000	2-275-2-TS	STAIRCASE
0.8000	2-279-1-TS	STAIRCASE
0.8000	2-281-1-LW	WR WC & SHR
0.8000	2-281-2-LW	WR WC & SHR
0.8000	2-284-1-LW	WR WC & SHR
0.8000	2-284-2-LW	WR WC & SHR
0.8000	2-291-1-LW	WR WC & SHR
0.8000	2-291-2-LW	WR WC & SHR
0.8000	2-295-1-LW	WR WC & SHR
0.8000	2-295-4-LW	WR WC & SHR
0.8000	2-95-2-Q	FWD IC/GYRO ROOM
0.8000	5-49-0-E	BOW THRUSTER MACHINERY ROOM
0.8000	5-76-0-E	BOW THRUSTER MACHINERY ROOM
0.9900	1-174-1-L	MEDICAL TREATMENT & EXAMINATION ROOM
0.9900	1-199-1-L	MEDICAL STORES
0.9900	1-199-3-L	X-RAY DARKROOM
0.9900	1-210-0-M	SMALL ARMS STOW & REPAIR
0.9900	2-61-1-M	SMALL ARMS & DEM MAG
1.3200	01-153-1-A	STOREROOM
1.3200	01-218-8-A	SCIENCE BAGGAGE ROOM

1.3200	01-239-8-A	FAN ROOM
1.3200	01-255-10-A	STOREROOM
1.3200	02-145-1-A	STOREROOM
1.3200	02-162-2-A	STOREROOM
1.3200	03-157-1-A	STOREROOM
1.3200	1-154-1-A	STOREROOM
1 3200	1-162-6-A	SHIP STORE STOREROOM
1.3200	1-233-2-A	BOAT GEAR LOCKER
1.3200	1-4-0-A	STOREROOM
1.3200	1-49-4-A	STOREROOM
1.3200	1-89-4-A	SODA STORAGE 1000 CASES
1.3200	2-154-1-A	STOREROOM
1.3200	2-162-5-Q	SHIP LAUNDRY
1.3200	2-180-1-Q	SELF-SERVICE LAUNDRY
1.3200	2-22-0-A	STOREROOM
1.3200	2-343-0-A	HAWSER STORES & SCIENCE CARGO
1.3200	2-343-3-C	AFT REPAIR NO.2
1.3200	2-388-1-A	STOREROOM
1.3200	2-388-2-A	STOREROOM
1.3200	2-4-0-A	STOREROOM
1.3200	2-65-1-Q	ENGINEERING STOREROOM
1.3200	2-65-2-C	FORWARD REPAIR NO.3
1.3200	3-22-0-A	STOREROOM
1.3200	3-4-0-A	STOREROOM
2.0000	2-251-2-A	BATTERY ROOM
2.6400	03-154-1-Q	HAM SHACK
2.6400	1-49-0-Q	FAN ROOM
3.0000	01-162-5-A	ARCTIC GEAR LOCKER--OFFICER/CPO
3.0000	01-255-8-A	XFMR FECT HELO
3.0000	1-207-5-A	BOAT GEAR LOCKER
3.0000	1-223-4-A	LIFE JACKET LOCKER
3.0000	1-307-2-A	ARCTIC GEAR LOCKER--SCIENTIST
3.0000	2-343-2-A	BOSN'S LOCKER
4.0000	01-218-3-A	GEAR LOCKER
4.0000	01-218-4-A	GEAR LOCKER
4.0000	02-158-2-A	GEAR LOCKER
4.0000	03-132-2-A	ELECTRONIC STOREROOM
4.0000	03-157-2-A	GEAR LOCKER
4.0000	03-162-1-A	GEAR LOCKER
4.0000	04-126-4-A	GEAR LOCKER
4.0000	1-207-3-A	LIFE JACKET LOCKER
4.0000	1-210-3-A	GEAR LOCKER
4.0000	1-223-0-C	AFT REPAIR NO.3 & DAMAGE CONTROL WORKS
4.0000	1-239-2-A	PHOTO LAB
4.0000	2-100-3-A	GEAR LOCKER
4.0000	2-157-2-A	GEAR LOCKER
4.0000	2-162-4-Q	MACHINE SHOP
6.0000	2-49-1-A	SEA BAG LOCKER
8.0000	01-126-1-Q	OFFICER PANTRY
8.0000	01-138-1-T	DUMB WAITER
8.0000	01-146-3-L	OFFICER SR

8.0000	01-271-2-Q	SCIENTIST LIBRARY/CONFERENCE ROOM
8.0000	01-311-2-Q	HOIST EQPT ROOM
8.0000	01-312-2-Q	SCIENTIST COMM CENTER
8.0000	02-129-1-Q	PANTRY
8.0000	02-138-1-T	DUMB WAITER
8.0000	1-100-6-Q	SHIP LIBRARY
8.0000	1-138-1-T	DUMB WAITER
8.0000	1-145-1-T	MACHINERY HOIST ROOM
8.0000	1-162-4-Q	SHIP STORE
8.0000	1-169-2-T	MACHINERY HOIST ROOM
8.0000	1-178-4-QO	SUPPLY OFFICE
8.0000	1-178-6-QO	SUPPLY OFFICER OFFICE
8.0000	1-187-2-QO	1ST LT OFFICE
8.0000	1-198-2-QO	SHIP OFFICE
8.0000	1-206-2-QO	EXO OFFICE
8.0000	1-210-1-Q	BARBER SHOP
8.0000	1-210-2-Q	MAIL ROOM
8.0000	1-213-3-L	Q.M. SHELTER
8.0000	1-217-2-A	C.G. LOCKER
8.0000	1-218-2-A	C.G. LOCKER
8.0000	1-223-6-L	Q.M. SHELTER
8.0000	1-311-2-T	ELEVATOR
8.0000	1-89-2-QO	COMMISSARY OFFICE
8 0000	2-100-5-A	STACK CHAIR LOCKER
8.0000	2-130-2-QO	EXO OFFICE
8.0000	2-145-1-T	MACHINERY HOIST
8.0000	2-146-2-Q	ENGINEERING LOG & DAMAGE CONTROL CENTER
8.0000	2-148-1-Q	ATHLETIC GEAR LOCKER
8.0000	2-148-3-Q	WEIGHT ROOM & GYM
8.0000	2-169-2-T	MACHINERY HOIST
8.0000	2-205-1-Q	ELECTRIC SHOP
8.0000	2-311-2-T	ELEVATOR
8.0000	3-311-2-T	ELEVATOR TRUNK

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APPENDIX D

Fire Safety Objectives for PIR

Appendix D is an alphabetical listing of compartments by Use Indicator ordered by Compartment ID within each Indicator. Parameters listed for each compartment are those specifying the Fire Safety Objectives and the frequency of fire.

Glossary:

Frequency of EB - The expected frequency of established burning expressed as the ratio of number of fires anticipated per year. The data is based on historical records of fire casualties.

Uloss - A rating assigned to each compartment assessing the magnitude of the fire loss needed to cause loss of ship mission capabilities. Assigned values range from 1 (where a fire simply reaching Established Burning in the compartment would threaten mission performance) to 8 (where all compartments of one type lost to fire would be considered unacceptable.)

Frequency uloss - The threshold frequency of the unacceptable loss. It is expressed as the number of times the compartment can be lost per ship year.

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FIRE SAFETY OBJECTIVES
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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Compt ID	Compartment Name	Area	Freq. EB	uloss	Freq uloss
Use ID: AA					
2-49-0-AA	SCIENCE STORAGE--UPP	3007	.0009	3	.1000
3-311-0-AA	SCIENCE STORAGE--AFT	2058	.0009	3	.1000
3-49-0-AA	CARGO HOLD	1548	.0009	3	.1000
Use ID: AG					
01-162-5-A	ARCTIC GEAR LOCKER--	163	.0009	3	1.0000
01-218-3-A	GEAR LOCKER	42	.0009	4	1.0000
01-218-4-A	GEAR LOCKER	37	.0009	4	1.0000
01-255-8-A	XFMR FECT HELO	25	.0009	3	1.0000
02-158-2-A	GEAR LOCKER	24	.0009	4	1.0000
03-157-2-A	GEAR LOCKER	27	.0009	4	1.0000
03-162-1-A	GEAR LOCKER	21	.0009	4	1.0000
04-126-4-A	GEAR LOCKER	26	.0009	4	1.0000
1-207-3-A	LIFE JACKET LOCKER	54	.0009	4	1.0000
1-207-5-A	BOAT GEAR LOCKER	75	.0009	3	1.0000
1-210-3-A	GEAR LOCKER	9	.0009	4	1.0000
1-217-2-A	C.G. LOCKER	22	.0009	8	1.0000
1-218-2-A	C.G. LOCKER	36	.0009	8	1.0000
1-223-4-A	LIFE JACKET LOCKER	64	.0009	3	1.0000
1-233-2-A	BOAT GEAR LOCKER	48	.0009	4	.3300
1-307-2-A	ARCTIC GEAR LOCKER--	220	.0009	3	1.0000
2-100-3-A	GEAR LOCKER	22	.0009	4	1.0000
2-100-5-A	STACK CHAIR LOCKER	20	.0009	8	1.0000
2-148-1-Q	ATHLETIC GEAR LOCKER	20	.0009	8	1.0000
2-157-2-A	GEAR LOCKER	19	.0009	4	1.0000
2-343-2-A	BOSN'S LOCKER	302	.0009	3	1.0000
2-49-1-A	SEA BAG LOCKER	168	.0009	6	1.0000
Use ID: AR					
1-255-1-A	REEFER	320	.0009	3	.0330
1-49-3-A	FROZEN STOREROOM NO.	429	.0009	3	.0330
1-61-1-A	THAW STOREROOM	112	.0009	3	.0330
1-61-3-A	CHILL STOREROOM	288	.0009	3	.0330
1-81-1-A	FROZEN STOREROOM NO.	423	.0009	3	.0330
Use ID: AS					
01-153-1-A	STOREROOM	43	.0009	4	.3300
01-218-8-A	SCIENCE BAGGAGE ROOM	170	.0009	4	.3300
01-255-10-A	STOREROOM	64	.0009	4	.3300
02-145-1-A	STOREROOM	96	.0009	4	.3300
02-162-2-A	STOREROOM	96	.0009	4	.3300
03-132-2-A	ELECTRONIC STOREROOM	651	.0009	4	1.0000
03-147-1-A	STOREROOM	70	.0009	8	.1000
03-157-1-A	STOREROOM	27	.0009	4	.3300
1-154-1-A	STOREROOM	48	.0009	4	.3300
1-162-6-A	SHIP STORE STOREROOM	91	.0009	4	.3300
1-207-1-A	STOREROOM	56	.0009	3	.1000

1-4-0-A	STOREROOM	611	.0009	4	.3300
1-49-4-A	STOREROOM	701	.0009	4	.3300
1-64-2-A	DRY PROVISION STORER	725	.0009	3	1000
1-89-4-A	SODA STORAGE 1000 CA	110	.0009	4	.3300
2-154-1-A	STOREROOM	46	.0009	4	.3300
2-195-1-A	ELECTRICAL STOREROOM	252	.0009	2	.1000
2-22-0-A	STOREROOM	1274	.0009	4	.3300
2-343-0-A	HAWSER STORES & SCIE	852	.0009	4	.3300
2-388-1-A	STOREROOM	288	.0009	4	.3300
2-389-2-A	STOREROOM	228	.0009	4	.3300
2-4-0-A	STOREROOM	494	.0009	4	.3300
2-65-1-Q	ENGINEERING STOREROO	586	.0009	4	.3300
3-22-0-A	STOREROOM	740	.0009	4	.3300
3-4-0-A	STOREROOM	87	.0009	4	.3300

Use ID: C

01-319-0-C	SCIENCE & WINCH CONT	716	.0012	3	.1000
04-108-0-C	PILOT HOUSE	1706	.0012	3	.0330
1-223-0-C	AFT REPAIR NO.3 & DA	608	.0012	4	1.0000
2-223-0-C	ENGINEERING CONTROL	1661	.0012	2	.0330
2-343-3-C	AFT REPAIR NO.2	446	.0012	4	.3300
2-65-2-C	FORWARD REPAIR NO.3	586	.0012	4	.3300

Use ID: E

02-178-0-E	EMERGENCY/HARBOR GEN	1440	.0204	8	.0330
03-178-2-E	AUXILIARY GENERATOR	800	.0204	8	.0330
1-178-1-E	BOILER ROOM UPPER LE	703	.0452	4	.0330
1-178-2-E	BOILER ROOM UPPER LE	703	.0452	4	.0330
2-178-1-E	BOILER ROOM	700	.0452	4	.0330
2-178-2-E	BOILER ROOM	700	.0452	4	.0330
2-361-1-E	STEERING GEAR ROOM	704	.0073	2	.0330
2-361-2-E	STEERING GEAR ROOM	702	.0073	2	.0330
3-100-0-E	ENGINE ROOM NO.1	3120	.0474	3	.0330
3-162-0-E	ENGINE ROOM NO.2	3432	.0474	3	.0330
3-223-0-E	MOTOR GENERATOR ROOM	2688	.0031	2	.0330
3-271-0-E	AUXILIARY MACHINERY	3179	.0033	3	.1000
4-100-0-E	ENGINE ROOM NO.1	3126	.0474	3	.0330
4-162-0-E	ENGINE ROOM NO.2	3432	.0474	3	.0330
4-223-0-E	MOTOR ROOM	2606	.0031	2	.0330
4-271-0-E	PUMP ROOM	1615	.0020	2	.0330
4-49-0-E	HYDRAULIC PUMP ROOM	1535	.0020	8	.0330
5-100-0-E	ENGINE ROOM NO.1	2391	.0474	3	.0330
5-162-0-E	ENGINE ROOM NO.2	2575	.0474	3	.0330
5-223-0-E	MOTOR ROOM	2013	.0031	2	.0330
5-49-0-E	BOW THRUSTER MACHINE	513	.0033	8	.1000
5-76-0-E	BOW THRUSTER MACHINE	696	.0033	8	.1000

Use ID: F

3-100-1-F	OIL TANK	472	.0000		.0000
3-100-2-F	OIL TANK	472	.0000		.0000
3-127-1-F	OIL TANK	318	.0000		.0000
3-127-2-F	OIL TANK	318	.0000		.0000
3-145-2-F	OIL TANK	237	.0000		.0000
3-162-1-F	OIL TANK	243	.0000		.0000
3-178-1-F	OIL TANK	322	.0000		.0000
3-178-2-F	OIL TANK	322	.0000		.0000
3-199-1-F	OIL TANK	354	.0000		.0000

3-199-2-F	OIL TANK	354	.0000		.0000
3-223-1-F	OIL TANK	358	.0000		.0000
3-223-2-F	OIL TANK	358	.0000		.0000
3-247-1-F	OIL TANK	329	.0000		.0000
3-247-2-F	OIL TANK	329	.0000		.0000
4-100-1-F	OIL TANK	714	.0000		.0000
4-100-2-F	OIL TANK	714	.0000		.0000
4-162-1-F	OIL TANK	674	.0000		.0000
4-162-2-F	OIL TANK	674	.0000		.0000
4-223-1-F	OIL TANK	491	.0000		.0000
4-223-2-F	OIL TANK	491	.0000		0000
4-271-1-F	LUBE OIL	180	.0000		.0000
4-271-2-F	LUBE OIL	180	.0000		.0000
4-49-1-F	OIL TANK	198	.0000		.0000
4-49-2-F	OIL TANK	198	.0000		.0000
4-76-1-F	OIL TANK	395	.0000		.0000
4-76-2-F	OIL TANK	395	.0000		.0000
5-100-1-F	OIL TANK	829	.0000		.0000
5-100-2-F	OIL TANK	829	.0000		.0000
5-162-1-F	OIL TANK	812	.0000		.0000
5-162-2-F	OIL TANK	812	.0000		.0000
5-223-1-F	OIL TANK	541	.0000		.0000
5-223-2-F	OIL TANK	541	.0000		.0000
5-271-0-F	OIL TANK	1528	.0000		.0000
5-76-1-F	OIL TANK	363	.0000		.0000
5-76-2-F	OIL TANK	363	.0000		.0000

Use ID: J

4-271-3-J	JP-5 STORAGE	295	.0000		.0000
4-271-4-J	JP-5 STORAGE	295	.0000		.0000
4-299-1-J	JP-5 SERVICE	43	.0000		.0000
4-299-2-J	JP-5 SERVICE	43	.0000		.0000
4-303-1-J	JP-5 STORAGE	81	.0000		.0000
4-303-2-J	JP-5 STORAGE	81	.0000		.0000

Use ID: K

1-028-0-K	FLAMMABLE LIQUIDS ST	576	.0015	1	.0330
1-344-0-K	HAZARDOUS MATLS. ROO	48	.0015	1	.0330

Use ID: L

01-146-3-L	OFFICER SR	177	.0008	8	1.0000
02-100-2-L	CO CABIN	382	.0008	7	.1000
1-174-1-L	MEDICAL TREATMENT &	414	.0008	3	.3300
1-199-1-L	MEDICAL STORES	110	.0008	3	.3300
1-213-3-L	Q.M. SHELTER	21	.0008	8	1.0000
1-223-6-L	Q.M. SHELTER	16	.0008	8	1.0000

Use ID: L1

01-225-0-L	SCIENTIST SR	116	.0008	7	.1000
02-100-4-L	CO SR	375	.0008	7	.1000
02-100-5-L	CHIEF SCIENTIST SR	424	.0008	7	.1000
02-120-2-L	OFFICER SR	288	.0008	7	.1000
02-120-6-L	VISITOR SR	340	.0008	7	.1000
02-122-3-L	OFFICER SR	304	.0008	7	.1000
02-136-3-L	OFFICER SR	209	.0008	7	.1000
02-136-4-L	OFFICER SR	233	.0008	7	.1000

02-146-1-L	OFFICER SR	249	.0008	7	.1000
04-132-2-L	SEA CABIN	129	.0008	7	.1000

Use ID: L10

2-100-2-L	CREW BERTHING	375	.0008	7	.1000
2-100-4-L	CREW BERTHING	402	.0008	7	.1000
2-121-3-L	CREW BERTHING	319	.0008	7	.1000
2-121-4-L	CREW BERTHING	358	.0008	7	.1000
2-271-2-L	CREW BERTHING	245	.0008	7	.1000
2-271-5-L	CREW BERTHING	381	.0008	7	.1000
2-271-6-L	CREW BERTHING	310	.0008	7	.1000

Use ID: L2

01-100-3-L	OFFICER SR	257	.0008	7	.1000
01-100-4-L	CPO BERTHING	186	.0008	7	.1000
01-113-2-L	CPO BERTHING	162	.0008	7	.1000
01-118-3-L	OFFICER SR	203	.0008	7	.1000
01-125-4-L	CPO BERTHING	168	.0008	7	.1000
01-132-3-L	OFFICER SR	143	.0008	7	.1000
01-162-6-L	CPO BERTHING	148	.0008	7	.1000
01-222-1-L	SCIENTIST SR	184	.0008	7	.1000
01-222-2-L	SCIENTIST SR	131	.0008	7	.1000
01-239-3-L	SCIENTIST SR	165	.0008	7	.1000
01-239-4-L	SCIENTIST SR	165	.0008	7	.1000
01-255-0-L	SCIENTIST SR	137	.0008	7	.1000
01-255-2-L	SCIENTIST SR	150	.0008	7	.1000
01-255-3-L	SCIENTIST SR	149	.0008	7	.1000
01-271-1-L	SCIENTIST SR	229	.0008	7	.1000
01-271-4-L	SCIENTIST SR	152	.0008	7	.1000
01-271-8-L	SCIENTIST SR	204	.0008	7	.1000
01-277-5-L	SCIENTIST SR	192	.0008	7	.1000
01-292-4-L	SCIENTIST SR	148	.0008	7	.1000
01-292-8-L	SCIENTIST SR	180	.0008	7	.1000
01-311-6-L	SCIENTIST SR	135	.0008	7	.1000
02-148-2-L	OFFICER SR	209	.0008	7	.1000
02-162-3-L	OFFICER SR	273	.0008	7	.1000
02-162-6-L	OFFICER SR	280	.0008	7	.1000
1-162-7-L	WARD NO.1	90	.0008	7	.1000
1-174-3-L	WARD NO.2	85	.0008	7	.1000

Use ID: L4

01-142-2-L	CPO BERTHING	224	.0008	7	.1000
2-291-3-L	CREW BERTHING	206	.0008	7	.1000

Use ID: L6

2-271-1-L	CREW BERTHING	245	.0008	7	.1000
2-291-4-L	CREW BERTHING	206	.0008	7	.1000
2-295-2-L	CREW BERTHING	289	.0008	7	.1000
2-295-3-L	CREW BERTHING	289	.0008	7	.1000

Use ID. L8

2-100-1-L	CREW BERTHING	269	.0008	7	.1000

Use ID: LL

01-100-0-LL	WARDROOM & LOUNGE	1182	.0006	4	.1000
02-100-1-LL	CO LOUNGE	456	.0006	4	.1000
1-100-5-LL	CREW MESS	1240	.0012	4	.1000
1-124-2-LL	CPO MESSROOM & LOUNG	764	.0012	4	.1000
2-100-7-LL	CREW LOUNGE	546	.0006	4	.1000
2-134-1-LL	CREW STUDY	244	.0006	4	.1000

Use ID: LP

01-100-2-LP	PASSAGE	446	.0001	8	.1000
01-114-1-LP	PASSAGE	377	.0001	8	.1000
01-162-2-LP	PASSAGE	196	.0001	8	.1000
01-162-3-LP	PASSAGE	144	.0001	8	.1000
01-178-1-LP	PASSAGE	224	.0001	8	.1000
01-218-5-LP	PASSAGE	439	.0001	8	.1000
01-218-6-LP	PASSAGE	138	.0001	8	.1000
01-239-6-LP	PASSAGE	128	.0001	8	.1000
01-255-6-LP	PASSAGE	210	.0001	8	.1000
01-292-2-LP	PASSAGE	175	.0001	8	.1000
02-115-1-LP	PASSAGE	339	.0001	8	.1000
02-121-2-LP	PASSAGE	317	.0001	8	.1000
02-178-1-LP	PASSAGE	160	.0001	8	.1000
03-111-2-LP	PASSAGE	334	.0001	8	.1000
03-140-1-LP	PASSAGE	386	.0001	8	.1000
1-100-0-LP	PASSAGE	268	.0001	8	.1000
1-100-2-LP	PASSAGE	245	.0001	8	.1000
1-100-3-LP	PASSAGE	245	.0001	8	.1000
1-162-2-LP	PASSAGE	259	.0001	8	.1000
1-162-3-LP	PASSAGE	405	.0001	8	.1000
1-207-2-LP	PASSAGE	185	.0001	8	.1000
1-223-2-LP	PASSAGE	384	.0001	8	.1000
1-239-1-LP	PASSAGE	38	.0001	8	.1000
1-319-0-LP	PASSAGE	347	.0001	8	.1000
1-49-1-LP	PASSAGE	437	.0001	8	.1000
1-49-2-LP	PASSAGE	533	.0001	8	.1000
1-52-0-LP	PASSAGE	504	.0001	8	.1000
2-100-0-LP	PASSAGE	969	.0001	8	.1000
2-162-2-LP	PASSAGE	397	.0001	8	.1000
2-162-3-LP	PASSAGE	335	.0001	8	.1000
2-223-1-LP	PASSAGE	206	.0001	8	.1000
2-223-2-LP	PASSAGE	192	.0001	8	.1000
2-271-3-LP	PASSAGE	267	.0001	8	.1000
2-271-4-LP	PASSAGE	264	.0001	8	.1000

Use ID: LW

01-106-2-LW	WR WC & SHR	48	.0002	8	.1000
01-111-1-LW	WR WC & SHR	66	.0002	8	.1000
01-117-2-LW	WR WC & SHR	54	.0002	8	.1000
01-118-1-LW	WR WC & SHR	40	.0002	8	1000
01-125-2-LW	WR WC & SHR	48	.0002	8	1000
01-132-1-LW	WR WC & SHR	33	.0002	8	.1000
01-146-1-LW	WR WC & SHR	46	.0002	8	.1000
01-154-2-LW	WR WC & SHR	45	.0002	8	.1000
01-162-4-LW	WR WC & SHR	38	.0002	8	.1000
01-218-1-LW	WC & SHR	42	.0002	8	.1000
01-218-2-LW	WC & SHR	47	.0002	8	.1000
01-222-0-LW	WC & SHR	27	.0002	8	.1000
01-239-1-LW	WC & SHR	27	.0002	8	.1000
01-239-2-LW	WC & SHR	27	.0002	8	.1000

01-255-1-LW	WC & SHR	22	.0002	8	.1000
01-255-4-LW	WC & SHR	25	.0002	8	.1000
01-255-5-LW	WC & SHR	26	.0002	8	.1000
01-271-6-LW	WR WC & SHR	38	.0002	8	.1000
01-277-1-LW	WC & SHR	25	.0002	8	.1000
01-277-3-LW	WC & SHR	25	.0002	8	.1000
01-278-2-LW	WR WC & SHR	39	.0002	8	.1000
01-292-6-LW	WR WC & SHR	34	.0002	8	.1000
01-298-2-LW	WR WC & SHR	41	.0002	8	.1000
01-311-4-LW	WR WC & SHR	38	.0002	8	.1000
02-113-2-LW	WR WC & SHR	63	.0002	8	.1000
02-116-1-LW	WR WC & SHR	48	.0002	8	.1000
02-120-4-LW	WR WC & SHR	63	.0002	8	.1000
02-122-1-LW	WR WC & SHR	58	.0002	8	.1000
02-132-2-LW	WR WC & SHR	58	.0002	8	.1000
02-136-1-LW	WR WC & SHR	42	.0002	8	.1000
02-136-2-LW	WR WC & SHR	42	.0002	8	.1000
02-152-2-LW	WR WC & SHR	72	.0002	8	.1000
02-154-1-LW	WR WC & SHR	51	.0002	8	.1000
02-162-4-LW	WR WC & SHR	59	.0002	8	.1000
02-171-1-LW	WR WC & SHR	63	.0002	8	.1000
03-117-2-LW	WR & WC	33	.0002	8	.1000
04-126-2-LW	WR & WC	35	.0002	8	.1000
1-100-4-LW	WR & SHR	26	.0002	8	.1000
1-162-5-LW	WARD BATH	98	.0002	8	.1000
1-213-1-LW	WC & WR	28	.0002	8	.1000
1-302-2-LW	WTR WC & SHR	35	.0002	8	.1000
2-111-1-LW	WR WC & SHR	80	.0002	8	.1000
2-111-2-LW	WR WC & SHR	105	.0002	8	.1000
2-121-1-LW	WR WC & SHR	105	.0002	8	.1000
2-121-2-LW	WR WC & SHR	105	.0002	8	.1000
2-125-2-LW	WR WC & SHR	100	.0002	8	.1000
2-281-1-LW	WR WC & SHR	74	.0002	8	.1000
2-281-2-LW	WR WC & SHR	74	.0002	8	.1000
2-284-1-LW	WR WC & SHR	116	.0002	8	.1000
2-284-2-LW	WR WC & SHR	121	.0002	8	.1000
2-291-1-LW	WR WC & SHR	40	.0002	8	.1000
2-291-2-LW	WR WC & SHR	40	.0002	8	.1000
2-295-1-LW	WR WC & SHR	50	.0002	8	.1000
2-295-4-LW	WR WC & SHR	50	.0002	8	.1000

Use ID: M

1-210-0-M	SMALL ARMS STOW & RE	157	.0001	3	.3300
2-61-1-M	SMALL ARMS & DEM MAG	133	.0001	3	.3300

Use ID: Q

01-126-1-Q	OFFICER PANTRY	259	.0021	8	1.0000
01-311-2-Q	HOIST EQPT ROOM	64	.0033	8	1.0000
02-129-1-Q	PANTRY	236	.0021	8	1.0000
02-228-0-Q	HANGAR	2108	.0038	2	.1000
03-105-0-Q	RADIO ROOM	1313	.0012	2	.1000
03-105-1-A	ELECTRONIC EQUIPMENT	1165	.0012	1	.1000
03-106-2-A	ELECTRONIC SHOP	675	.0012	2	.1000
03-154-1-Q	HAN SHACK	66	.0012	8	.3300
03-228-0-Q	HANGAR	2088	.0038	2	.1000
1-105-0-Q	GALLEY	1185	.0021	3	.1000
1-119-1-Q	SCULLERY	182	.0021	8	.1000
1-132-1-Q	INCINERATOR ROOM	255	.0033	8	.1000

1-162-4-Q	SHIP STORE	205	.0006	8	1.0000
1-199-3-L	X-RAY DARKROOM	46	.0023	3	.3300
1-22-0-Q	ANCHOR WINDLASS MACH	1609	.0110	3	.1000
1-239-2-A	PHOTO LAB	128	.0023	4	1.0000
1-245-1-Q	SCIENCE REEFER MACHY	81	.0033	2	.1000
1-255-0-Q	ELECTRONICS LAB	288	.0023	3	.1000
1-271-2-Q	RECOMPRESSION AREA &	525	.0001	2	.3300
1-326-0-Q	VENT TRUNK	144	.0000	8	.0000
1-4-2-Q	BOW BOOM INSTRUMENT	169	.0023	3	.1000
1-49-5-Q	REEFER MACHINERY ROO	319	.0033	2	.1000
2-148-3-Q	WEIGHT ROOM & GYM	216	.0006	8	1.0000
2-162-4-Q	MACHINE SHOP	606	.0023	4	1.0000
2-162-5-Q	SHIP LAUNDRY	318	.0036	4	.3300
2-180-1-Q	SELF-SERVICE LAUNDRY	288	.0036	4	.3300
2-195-2-Q	FIREFIGHTING EQPT RO	489	.0009	3	.1000
2-205-1-Q	ELECTRIC SHOP	241	.0023	8	1.0000
2-210-0-Q	GRAVIMETER ROOM	112	.0009	3	.1000
2-223-3-Q	ELECTRICAL EQUIPMENT	803	.0012	2	.0330
2-223-4-Q	ELECTRICAL EQUIPMENT	803	.0012	2	.0330
2-251-2-A	BATTERY ROOM	35	.0012	2	1.0000
2-262-1-Q	IC/GYRO ROOM	242	.0012	2	.1000
2-311-0-Q	WINCH ROOM	2584	.0033	3	.1000
2-95-2-Q	FWD IC/GYRO ROOM	38	.0012	8	.1000
3-331-1-Q	VENT TRUNK	192	.0000	8	.0000

Use ID: QF

01-239-8-A	FAN ROOM	128	.0004	4	.3300
03-162-2-Q	FAN ROOM	489	.0004	3	.1000
03-162-3-Q	FAN ROOM	304	.0004	3	.1000
1-49-0-Q	FAN ROOM	236	.0004	8	.3300
2-262-2-QF	FAN ROOM	188	.0004	3	.1000

Use ID: QO

01-271-2-Q	SCIENTIST LIBRARY/CO	650	.0004	8	1.0000
02-218-0-QO	HELO EQUIP ROOM & OF	440	.0004	2	.3300
03-216-0-Q	AVIATION OFFICE	460	.0004	3	.1000
04-126-0-Q	METEROLOGY LAB & CHA	681	.0004	3	.0330
1-100-6-Q	SHIP LIBRARY	448	.0004	8	1.0000
1-178-4-QO	SUPPLY OFFICE	165	.0004	8	1.0000
1-178-6-QO	SUPPLY OFFICER OFFIC	91	.0004	8	1.0000
1-187-2-QO	1ST LT OFFICE	126	.0004	8	1.0000
1-198-2-QO	SHIP OFFICE	225	.0004	8	1.0000
1-206-2-QO	EXO OFFICE	126	.0004	8	1.0000
1-210-1-Q	BARBER SHOP	107	.0004	8	1.0000
1-210-2-Q	MAIL ROOM	64	.0004	8	1.0000
1-89-2-QO	COMMISSARY OFFICE	88	.0004	8	1.0000
2-130-2-QO	EXO OFFICE	270	.0004	8	1.0000
2-146-2-Q	ENGINEERING LOG & DA	293	.0004	8	1.0000
2-210-01-Q	COMPUTER/NAV LAB	408	.0004	3	.1000

Use ID: QS

01-295-1-Q	VESTIBULE	528	.0023	3	.1000
01-312-2-Q	SCIENTIST COMM CENTE	52	.0023	8	1.0000
1-239-0-Q	DRY LAB	488	.0023	3	.1000
1-271-0-Q	WET LAB	784	.0023	3	.1000
1-287-2-Q	WET LAB NO.2	451	.0023	3	.1000
1-295-1-Q	VESTIBULE	528	.0023	3	.1000

1-328-1-Q	PORTABLE VAN	160	.0000	3	.1000
1-328-2-Q	PORTABLE VAN	160	.0000	3	.1000
1-328-4-Q	PORTABLE VAN	160	.0000	3	.1000

Use ID: T

01-138-1-T	DUMB WAITER	16	.0001	8	1.0000
02-138-1-T	DUMB WAITER	15	.0001	8	1.0000
1-138-1-T	DUMB WAITER	15	.0001	8	1.0000
1-145-1-T	MACHINERY HOIST ROOM	48	.0001	8	1.0000
1-169-2-T	MACHINERY HOIST ROOM	49	.0001	8	1.0000
1-311-2-T	ELEVATOR	60	.0001	8	1.0000
2-145-1-T	MACHINERY HOIST	48	.0001	8	1.0000
2-169-2-T	MACHINERY HOIST	49	.0001	8	1.0000
2-311-2-T	ELEVATOR	67	.0001	8	1.0000
3-311-2-T	ELEVATOR TRUNK	67	.0001	8	1.0000

Use ID: TS

01-100-1-TS	STAIRCASE	87	.0001	8	.1000
01-145-2-TS	STAIRCASE	70	.0001	8	.1000
01-162-1-TS	STAIRCASE	96	.0001	8	.1000
01-261-2-TS	STAIRCASE	38	.0001	8	.1000
02-100-3-TS	STAIRCASE	71	.0001	8	.1000
02-145-2-TS	STAIRCASE	72	.0001	8	.1000
02-162-1-TS	STAIRCASE	96	.0001	8	.1000
03-129-1-TS	STAIRCASE	40	.0001	8	.1000
03-145-2-TS	STAIRCASE	70	.0001	8	.1000
03-165-1-TS	STAIRCASE	55	.0001	8	.1000
1-100-1-TS	STAIRCASE	87	.0001	8	.1000
1-145-2-TS	STAIRCASE	96	.0001	8	.1000
1-162-1-TS	STAIRCASE	76	.0001	8	.1000
1-213-2-TS	STAIRCASE	38	.0001	8	.1000
1-255-2-TS	STAIRCASE	128	.0001	8	.1000
1-278-2-TS	STAIRCASE	40	.0001	8	.1000
2-105-1-TS	STAIRCASE	38	.0001	8	.1000
2-145-2-TS	STAIRCASE	66	.0001	8	.1000
2-162-1-TS	STAIRCASE	112	.0001	8	.1000
2-210-2-TS	STAIRCASE	104	.0001	8	.1000
2-256-1-TS	STAIRCASE	56	.0001	8	.1000
2-256-2-TS	STAIRCASE	105	.0001	8	.1000
2-275-2-TS	STAIRCASE	104	.0001	8	.1000
2-279-1-TS	STAIRCASE	36	.0001	8	.1000

Use ID: TU

01-145-0-TU	UPTAKE 1	512	.0012		.0000
01-162-0-TU	UPTAKE 2	512	.0012		.0000
02-145-0-TU	UPTAKE 1	512	.0012		.0000
02-162-0-TU	UPTAKE 2	512	.0012		.0000
03-145-0-TU	UPTAKE 1	518	.0012		.0000
03-162-0-TU	UPTAKE 2	505	.0012		.0000
04-145-0-TU	UPTAKE 1	512	.0012		.0000
04-162-0-TU	UPTAKE 2	512	.0012		.0000
1-145-0-TU	UPTAKE 1	512	.0012		.0000
1-162-0-TU	UPTAKE 2	512	.0012		.0000
2-145-0-TU	UPTAKE 1	505	.0012		.0000
2-162-0-TU	UPTAKE 2	512	.0012		.0000

Use ID: V

1-49-7-V	VOID SPACE	172	.0003	.0000
3-145-1-V	VOID SPACE	237	.0003	.0000
3-162-2-V	VOID SPACE	243	.0003	.0000
3-46-1-V	VOID SPACE	1010	.0003	.0000
3-46-2-V	VOID SPACE	1010	.0003	.0000
5-45-0-V	VOID SPACE	11	.0003	.0000

Use ID: W

01-178-0-W	ROLL STAB TANK CROSS	1376	.0000	.0000
01-178-2-W	ROLL STABILIZATION T	560	.0000	.0000
01-178-3-W	ROLL STABILIZATION T	560	.0000	.0000
02-178-2-W	ROLL STABILIZATION T	720	.0000	.0000
02-178-3-W	ROLL STABILIZATION T	560	.0000	.0000
2-014-0-W	PEAK TANK	189	.0000	.0000
4-262-0-W	GREY/BLK WTR HOLDING	81	.0000	.0000
4-31-0-W	TRIM TANK	198	.0000	.0000
4-311-0-W	BILGE TANK	1518	.0000	.0000

[BLANK]

APPENDIX E

Fire Hazards for PIR

A Listing of Compartment Parameters Used to Quantify Fire Hazards

Appendix E is an alphabetical listing of compartments by Use Indicator ordered by Compartment ID within each Indicator.

Glossary

Class A Fuel - Cellulosics and plastics in pounds/square foot contained in a compartment.

Class B Fuel - Liquid combustibles in gallons contained in a compartment.

I Values - A percentage representing the probability that the fire will terminate itself if this compartment is
a. the room of origin (I|EB).
b. a room ignited by a thermal failure (I|Tbar)
c. a room ignited by a durability failure (I|Dbar)

FRI|EB - The time when the compartment as room of origin reaches Full Room Involvement or Flashover measured from the time it has reached Established Burning.

[BLANK]

FIRE HAZARDS
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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Compt ID	FUEL Class A (psf)	FUEL Class B (gal)	I VALUES I|EB	I VALUES I|Tbar	I VALUES I|Dbar	Area (sqft)	FRI/EB (min)
Use ID: AA							
2-49-0-AA	225.0	0.00	30	20	10	3007	13
3-311-0-AA	200.0	0.00	30	20	10	2058	12
3-49-0-AA	250.0	0.00	30	20	10	1548	11
Use ID: AG							
01-162-5-A	15.0	0.00	5	5	0	163	3
01-218-3-A	135.0	0.00	20	10	0	42	3
01-218-4-A	135.0	0.00	20	10	0	37	3
01-255-8-A	1 0	0.00	30	20	10	25	3
02-159-2-A	135.0	0.00	20	10	0	24	3
03-157-2-A	135.0	0.00	20	10	0	27	3
03-162-1-A	135.0	0.00	20	10	0	21	3
04-126-4-A	135.0	0.00	20	10	0	26	3
1-207-3-A	15.0	0.00	10	5	0	54	3
1-207-5-A	15 0	0.00	10	5	0	75	5
1-210-3-A	135.0	0.00	20	10	0	9	3
1-217-2-A	10.0	0.00	10	5	0	22	3
1-218-2-A	10.0	0.00	10	5	0	36	3
1-223-4-A	15 0	0 00	10	5	0	64	3
1-233-2-A	260.0	0.00	30	20	10	48	3
1-307-2-A	15.0	0.00	5	5	0	220	3
2-100-3-A	135.0	0.00	20	10	0	22	3
2-100-5-A	2.0	0.00	50	40	30	20	4
2-148-1-Q	2.0	0.00	30	20	10	20	3
2-157-2-A	135.0	0.00	20	10	0	19	3
2-343-2-A	15.0	0.00	10	5	0	302	8
2-49-1-A	10.0	0.00	20	10	0	168	5
Use ID: AR							
1-255-1-A	150.0	0.00	60	50	40	320	999
1-49-3-A	150.0	0.00	60	50	40	429	999
1-61-1-A	150.0	0.00	60	50	40	112	999
1-61-3-A	150.0	0.00	60	50	40	288	999
1-81-1-A	150.0	0.00	60	50	40	423	999
Use ID: AS							
01-153-1-A	200.0	0.00	30	20	10	49	3
01-218-8-A	200.0	0.00	30	20	10	170	4
01-255-10-A	200.0	0.00	30	20	10	64	4
02-145-1-A	180 0	0.00	30	20	10	96	4
02-162-2-A	180.0	0.00	30	20	10	96	4

03-132-2-A	3.5	0.00	15	10	5	651	6
03-147-1-A	0.5	0.00	30	20	10	70	4
03-157-1-A	180.0	0.00	30	20	10	27	3
1-154-1-A	260.0	0.00	30	20	10	48	3
1-162-6-A	260.0	0.00	30	20	10	91	4
1-207-1-A	4.0	0.00	20	15	5	56	4
1-4-0-A	260.0	0.00	30	20	10	611	6
1-49-4-A	260.0	0.00	30	20	10	701	6
1-64-2-A	260 0	0.00	30	20	10	725	6
1-89-4-A	260.0	0.00	30	20	10	110	10
2-154-1-A	180.0	0.00	30	20	10	46	3
2-195-1-A	180.0	0.00	30	20	10	252	5
2-22-0-A	180.0	0.00	30	20	10	1274	8
2-343-0-A	160.0	0.00	30	20	10	852	8
2-388-1-A	160.0	0.00	30	20	10	288	5
2-388-2-A	160.0	0.00	30	20	10	228	5
2-4-0-A	180.0	0.00	30	20	10	494	6
2-65-1-Q	15.0	0.00	15	5	0	586	6
3-22-0-A	200.0	0.00	30	20	10	740	6
3-4-0-A	200.0	0.00	30	20	10	87	4

Use ID: C

01-319-0-C	1.0	0.00	80	60	20	716	8
04-108-0-C	1.5	0.00	70	55	20	1706	12
1-223-0-C	4.0	0.00	20	15	5	608	6
2-223-0-C	1.5	0.00	70	55	20	1661	12
2-343-3-C	4.0	0.00	20	15	5	446	6
2-65-2-C	4.0	0.00	20	15	5	586	6

Use ID: E

02-178-0-E	2.0	0.02	0	5	0	1440	3
03-178-2-E	0.5	0.00	30	20	10	800	3
1-178-1-E	1.0	0.01	0	15	0	703	3
1-178-2-E	0.1	0.01	0	0	0	703	3
2-178-1-E	1.0	0.01	0	15	0	700	3
2-178-2-E	1.0	0.01	0	15	0	700	3
2-361-1-E	1.0	0.32	30	20	10	704	7
2-361-2-E	1.0	0.32	30	20	10	702	7
3-100-0-E	1.0	0.08	0	5	5	3120	6
3-162-0-E	1.0	0.07	0	5	5	3432	6
3-223-0-E	2.0	0.02	0	5	0	2688	5
3-271-0-E	2.0	0.01	0	5	0	3179	5
4-100-0-E	1.0	0.08	0	5	5	3126	6
4-162-0-E	1.0	0.07	0	15	5	3432	6
4-223-0-E	2.0	0.02	0	5	0	2606	6
4-271-0-E	2 0	0.02	0	5	0	1615	3
4-49-0-E	2.0	0.02	0	5	0	1535	4
5-100-0-E	1.0	0.10	0	5	5	2391	6
5-162-0-E	1.0	0.09	0	5	5	2575	6
5-223-0-E	2.0	0.03	0	5	0	2013	6
5-49-0-E	2.0	0.06	0	5	0	513	6

5-76-0-E	2 0	0.04	0	5	0	696	6

Use ID: F

3-100-1-F	0.0	0.00	-1	0	0	472	-1
3-100-2-F	0.0	0.00	-1	0	0	472	-1
3-127-1-F	0.0	0.00	-1	0	0	318	-1
3-127-2-F	0.0	0.00	-1	0	0	318	-1
3-145-2-F	0.0	0.00	-1	0	0	237	-1
3-162-1-F	0.0	0.00	-1	0	0	243	-1
3-178-1-F	0.0	0.00	-1	0	0	322	-1
3-178-2-F	0 0	0.00	-1	0	0	322	-1
3-199-1-F	0.0	0.00	-1	0	0	354	-1
3-199-2-F	0.0	0.00	-1	0	0	354	-1
3-223-1-F	0.0	0.00	-1	0	0	358	-1
3-223-2-F	0.0	0.00	-1	0	0	358	-1
3-247-1-F	0.0	0.00	-1	0	0	329	-1
3-247-2-F	0.0	0.00	-1	0	0	329	-1
4-100-1-F	0.0	0.00	-1	0	0	714	-1
4-100-2-F	0 0	0.00	-1	0	0	714	-1
4-162-1-F	0.0	0.00	-1	0	0	674	-1
4-162-2-F	0.0	0.00	-1	0	0	674	-1
4-223-1-F	0.0	0.00	-1	0	0	491	-1
4-223-2-F	0.0	0.00	-1	0	0	491	-1
4-271-1-F	0.0	0.00	-1	0	0	180	-1
4-271-2-F	0.0	0.00	-1	0	0	180	-1
4-49-1-F	0.0	0.00	-1	0	0	198	-1
4-49-2-F	0.0	0.00	-1	0	0	198	-1
4-76-1-F	0.0	0.00	-1	0	0	395	-1
4-76-2-F	0.0	0.00	-1	0	0	395	-1
5-100-1-F	0.0	0.00	-1	0	0	829	-1
5-100-2-F	0.0	0.00	-1	0	0	829	-1
5-162-1-F	0.0	0.00	-1	0	0	812	-1
5-162-2-F	0.0	0.00	-1	0	0	812	-1
5-223-1-F	0.0	0.00	-1	0	0	541	-1
5-223-2-F	0.0	0.00	-1	0	0	541	-1
5-271-0-F	0.0	0.00	-1	0	0	1528	-1
5-76-1-F	0.0	0.00	-1	0	0	363	-1
5-76-2-F	0.0	0.00	-1	0	0	363	-1

Use ID: J

4-271-3-J	0.0	0.00	-1	0	0	295	-1
4-271-4-J	0.0	0.00	-1	0	0	295	-1
4-299-1-J	0.0	0.00	-1	0	0	43	-1
4-299-2-J	0.0	0.00	-1	0	0	43	-1
4-303-1-J	0.0	0.00	0	0	0	81	-1
4-303-2-J	0.0	0.00	0	0	0	81	-1

Use ID: K

1-028-0-K	1.0	0.02	5	20	5	576	2
1-344-0-K	0.0	0.21	10	25	5	48	2

Use ID: L

01-146-3-L	2.5	0.00	20	15	5	177	5
[illegible] 100-2-L	2.5	0.00	20	15	5	382	5
[illegible]74-1-L	2 5	0.00	20	15	5	414	7
[illegible]-199-1-L	50.0	0.00	30	20	10	110	4
1-213-3-L	2 5	0.00	20	15	5	21	-1
1-223-6-L	2.5	0.00	20	15	5	16	-1

Use ID: L1

01-225-0-L	1.5	0.00	20	15	5	116	5
02-100-4-L	0.5	0.00	20	15	5	375	5
02-100-5-L	0.4	0.00	20	15	5	424	5
02-120-2-L	0 7	0.00	20	15	5	288	5
02-120-6-L	0.6	0.00	20	15	5	340	5
02-122-3-L	0.6	0.00	20	15	5	304	5
02-136-3-L	0.9	0.00	20	15	5	209	5
02-136-4-L	0.8	0.00	20	15	5	233	5
02-146-1-L	0.8	0.00	20	15	5	249	5
04-132-2-L	2.3	0.00	20	15	5	129	5

Use ID: L10

2-100-2-L	4.2	0.00	10	5	0	375	4
2-100-4-L	3.9	0.00	10	5	0	402	4
2-121-3-L	5 0	0.00	10	5	0	[illegible]	4
2-121-4-L	4.4	0.00	10	5	0	358	4
2-271-2-L	6.5	0.00	10	5	0	245	4
2-271-5-L	4.1	0.00	10	5	0	381	4
2-271-6-L	5.2	0.00	10	5	0	310	4

Use ID: L2

01-100-3-L	1.6	0.00	20	15	5	257	5
01-100-4-L	4.1	0.00	15	10	5	186	3
01-113-2-L	4.1	0.00	15	10	5	162	3
01-118-3-L	2.0	0.00	20	15	5	203	5
01-125-4-L	4.1	0.00	15	10	5	168	3
01-132-3-L	1 6	0.00	20	15	5	143	5
01-162-6-L	4.1	0.00	15	10	5	148	3
01-222-1-L	2.4	0.00	20	15	5	184	5
01-222-2-L	2.4	0.00	20	15	5	131	5
01-239-3-L	2.3	0.00	20	15	5	165	5
01-239-4-L	2.3	0.00	20	15	5	165	5
01-255-0-L	2.9	0.00	20	15	5	137	5
01-255-2-L	2.6	0.00	20	15	5	150	5
01-255-3-L	2.6	0.00	20	15	5	149	5
01-271-1-L	1.7	0.00	20	15	5	229	5
01-271-4-L	2.5	0.00	20	15	5	152	5
01-271-8-L	2.3	0.00	20	15	5	204	5
01-277-5-L	2.0	0.00	20	15	5	192	5
01-292-4-L	2.1	0.00	20	15	5	148	5
01-292-8-L	2 3	0.00	20	15	5	180	5
01-311-6-L	2.6	0.00	20	15	5	135	5

02-148-2-L	1 9	0.00	20	15	5	209	5
02-162-3-L	1.3	0.00	20	15	5	273	5
02-162-6-L	1.0	0.00	20	15	5	280	5
1-162-7-L	4.4	0.00	20	15	5	90	4
1-174-3-L	4.7	0.00	20	15	5	85	4

Use ID: L4

01-142-2-L	2.3	0.00	10	5	0	224	3
2-291-3-L	3 1	0.00	10	5	0	206	3

Use ID: L6

2-271-1-L	3.9	0.00	10	5	0	245	4
2-291-4-L	4.6	0.00	10	5	0	206	4
2-295-2-L	3.3	0.00	10	5	0	289	4
2-295-3-L	3.3	0.00	10	5	0	289	4

Use ID: L8

2-100-1-L	4.7	0.00	10	5	0	269	4

Use ID: LL

01-100-0-LL	3.1	0.00	20	15	5	1182	10
02-100-1-LL	3.1	0.00	20	15	5	456	5
1-100-5-LL	0.5	0.00	70	50	10	1240	15
1-124-2-LL	3.1	0.00	20	15	5	764	10
2-100-7-LL	3.1	0.00	20	15	5	546	15
2-134-1-LL	3.1	0.00	20	15	5	244	5

Use ID: LP

01-100-2-LP	0.4	0.00	95	80	40	446	20
01-114-1-LP	0.4	0.00	95	80	40	377	20
01-162-2-LP	0.4	0.00	95	80	40	196	20
01-162-3-LP	0 4	0.00	95	80	40	144	20
01-178-1-LP	0.4	0.00	95	80	40	224	20
01-218-5-LP	0.4	0.00	95	80	40	439	20
01-218-6-LP	0.4	0.00	95	80	40	138	20
01-239-6-LP	0.4	0.00	95	80	40	128	20
01-255-6-LP	0.4	0.00	95	80	40	210	20
01-292-2-LP	0 4	0.00	95	80	40	175	20
02-115-1-LP	0.4	0.00	95	80	40	339	20
02-121-2-LP	0 4	0.00	95	80	40	317	20
02-178-1-LP	0.4	0.00	95	80	40	160	20
03-111-2-LP	0.4	0.00	95	80	40	334	20
03-140-1-LP	0.4	0.00	95	80	40	386	20
1-100-0-LP	0.4	0.00	95	80	40	268	20
1-100-2-LP	0.0	0.00	95	80	40	245	20
1-100-3-LP	0.4	0.00	95	80	40	245	20
1-162-2-LP	0.4	0.00	95	80	40	259	20
1-162-3-LP	0.4	0.00	95	80	40	405	20

1-207-2-LP	0 4	0.00	95	80	40	185	20
1-223-2-LP	0.4	0.00	95	80	40	384	20
1-239-1-LP	0 4	0.00	95	80	40	38	20
1-319-0-LP	0.4	0 00	95	80	40	347	20
1-49-1-LP	0 4	0.00	95	80	40	437	20
1-49-2-LP	0.4	0.00	95	80	40	533	20
1-52-0-LP	0.4	0.00	95	80	40	504	20
2-100-0-LP	0.4	0.00	95	80	40	969	20
2-162-2-LP	0.4	0.00	95	80	40	397	20
2-162-3-LP	0.4	0.00	95	80	40	335	20
2-223-1-LP	0.4	0.00	95	80	40	206	20
2-223-2-LP	0.4	0.00	95	80	40	192	20
2-271-3-LP	0 4	0.00	95	80	40	267	20
2-271-4-LP	0.4	0.00	95	80	40	264	20

Use ID: LW

01-106-2-LW	0.5	0 00	100	100	35	48	999
01-111-1-LW	0.5	0.00	100	100	35	66	999
01-117-2-LW	0.5	0.00	100	100	35	54	999
01-118-1-LW	0.5	0.00	100	100	35	40	999
01-125-2-LW	0.5	0.00	100	100	35	48	999
01-132-1-LW	0.5	0.00	100	100	35	33	999
01-146-1-LW	0.0	0.00	100	100	35	46	999
01-154-2-LW	0.5	0.00	100	100	35	45	999
01-162-4-LW	0.5	0.00	100	100	35	38	999
01-218-1-LW	0 5	0.00	100	100	35	42	999
01-218-2-LW	0.5	0.00	100	100	35	47	999
01-222-0-LW	0.5	0.00	100	100	35	27	999
01-239-1-LW	0.5	0.00	100	100	35	27	999
01-239-2-LW	0.5	0.00	100	100	35	27	999
01-255-1-LW	0.5	0.00	100	100	35	22	999
01-255-4-LW	0 5	0.00	100	100	35	25	999
01-255-5-LW	0 5	0.00	100	100	35	26	999
01-271-6-LW	0 5	0.00	100	100	35	38	999
01-277-1-LW	0.5	0.00	100	100	35	25	999
01-277-3-LW	0.5	0.00	100	100	35	25	999
01-278-2-LW	0.5	0.00	100	100	35	39	999
01-292-6-LW	0 5	0.00	100	100	35	34	999
01-298-2-LW	0.5	0.00	100	100	35	41	999
01-311-4-LW	0 5	0.00	100	100	35	38	999
02-113-2-LW	0.5	0.00	100	100	35	63	399
02-116-1-LW	0.5	0.00	100	100	35	48	999
02-120-4-LW	0.5	0.00	100	100	35	63	999
02-122-1-LW	0.5	0.00	100	100	35	58	999
02-132-2-LW	0.5	0.00	100	100	35	58	999
02-136-1-LW	0.5	0.00	100	100	35	42	999
02-136-2-LW	0.5	0.00	100	100	35	42	999
02-152-2-LW	0 5	0.00	100	100	35	72	999
02-154-1-LW	0.5	0.00	100	100	35	51	999
02-162-4-LW	0 5	0.00	100	100	35	59	999
02-171-1-LW	0.5	0.00	100	100	35	63	999
03-117-2-LW	0 5	0.00	100	100	35	33	999

04-126-2-LW	0 5	0.00	100	100	35	35	999
1-100-4-LW	0.0	0.00	100	100	35	26	999
1-162-5-LW	0.5	0.00	100	100	35	98	999
1-213-1-LW	0.0	0.00	100	100	35	28	999
1-302-2-LW	0 5	0.00	100	100	35	35	999
2-111-1-LW	0.5	0.00	100	100	35	80	999
2-111-2-LW	0.5	0.00	100	100	35	105	999
2-121-1-LW	0.5	0.00	100	100	35	105	999
2-121-2-LW	0 5	0.00	100	100	35	105	999
2-125-2-LW	0.5	0.00	100	100	35	100	999
2-281-1-LW	0 5	0.00	100	100	35	74	999
2-281-2-LW	0.5	0.00	100	100	35	74	999
2-284-1-LW	0 5	0.00	100	100	35	116	999
2-284-2-LW	0.5	0.00	100	100	35	121	999
2-291-1-LW	0 5	0.00	100	100	35	40	999
2-291-2-LW	0.5	0.00	100	100	35	40	999
2-295-1-LW	0.5	0.00	100	100	35	50	999
2-295-4-LW	0.5	0.00	100	100	35	50	999

Use ID: M

1-210-0-M	400.0	0.00	5	25	0	157	3
2-61-1-M	400.0	0.00	5	25	0	133	3

Use ID: Q

01-126-1-Q	0.5	0.00	90	70	50	259	6
01-311-2-Q	0 5	0.00	0	0	0	64	3
02-129-1-Q	0.5	0.00	90	70	50	236	6
02-228-0-Q	0.0	0.00	-1	0	0	2108	-1
03-105-0-Q	2.0	0.00	20	15	5	1313	8
03-105-1-A	15 0	0.00	10	5	0	1165	10
03-106-2-A	180.0	0.00	30	20	10	675	6
03-154-1-Q	2.0	0.00	20	15	5	66	4
03-228-0-Q	0 0	0.00	-1	0	0	2088	-1
1-105-0-Q	0 5	0.00	90	70	50	1185	6
1-119-1-Q	0.5	0.00	100	100	50	182	999
1-132-1-Q	0 5	0.01	20	60	30	255	3
1-162-4-Q	4.0	0.00	20	15	5	205	3
1-199-3-L	2 5	0.00	20	15	5	46	4
1-22-0-Q	1.5	0.00	100	100	0	1609	999
1-239-2-A	15.0	0.00	20	10	0	128	5
1-245-1-Q	1.5	0.00	100	100	0	81	999
1-255-0-Q	3 5	0.00	15	10	5	288	6
1-271-2-Q	2.0	0.00	30	20	10	525	4
1-326-0-Q	0.0	0.00	0	0	0	144	-1
1-4-2-Q	2.0	0.00	20	15	5	169	6
1-49-5-Q	1 5	0.00	100	100	0	319	999
2-148-3-Q	2.0	0.00	30	20	10	216	5
2-162-4-Q	1 5	0.00	10	5	0	606	10
2-162-5-Q	2.0	0 00	60	40	20	318	3
2-180-1-Q	2.0	0.00	60	40	20	286	3
2-195-2-Q	4.0	0.00	30	20	10	489	6

2-205-1-Q	3 5	0 00	15	10	5	241	8
2-210-0-Q	1.5	0.00	30	20	10	112	10
2-223-3-Q	3 5	0.00	15	10	5	803	8
2-223-4-Q	3.5	0.00	15	10	5	803	8
2-251-2-A	5 0	0.00	10	10	0	35	1
2-262-1-Q	1.5	0.00	30	20	10	242	11
2-311-0-Q	1 5	0.00	100	100	0	2584	999
2-95-2-Q	1.5	0.00	30	20	10	38	5
3-331-1-Q	0 0	0.00	0	0	0	192	-1

Use ID: QF

01-239-8-A	200.0	0.00	100	100	10	128	999
03-162-2-Q	0.5	0.00	100	100	30	489	999
03-162-3-Q	0.5	0.00	100	100	30	304	999
1-49-0-Q	0.5	0.00	100	100	30	236	999
2-262-2-QF	0.5	0.00	100	100	30	188	999

Use ID: QO

01-271-2-Q	2 5	0.00	20	15	5	650	5
02-218-0-QO	2.5	0.00	20	15	5	440	5
03-218-0-Q	0.5	0.00	20	15	5	460	5
04-126-0-Q	2 5	0.00	20	15	5	681	5
1-100-6-Q	2.5	0.00	20	15	5	448	5
1-178-4-QO	2.5	0.00	20	15	5	165	5
1-178-6-QO	2.5	0.00	20	15	5	91	5
1-187-2-QO	2 5	0.00	20	15	5	126	5
1-198-2-QO	2.5	0.00	20	15	5	225	5
1-206-2-QO	2 5	0.00	20	15	5	126	5
1-210-1-Q	2.5	0.00	20	15	5	107	5
1-210-2-Q	2 5	0.00	20	15	5	64	5
1-89-2-QO	2.5	0.00	20	15	5	88	5
2-130-2-QO	2 5	0.00	20	15	5	270	5
2-146-2-Q	2.5	0.00	20	15	5	293	5
2-210-01-Q	2 5	0.00	20	15	5	408	5

Use ID: QS

01-295-1-Q	0.5	0.00	90	90	0	528	999
01-312-2-Q	3.5	0.00	15	0	0	52	4
1-239-0-Q	4.0	0.00	15	0	0	488	6
1-271-0-Q	2 0	0.00	70	0	0	784	8
1-287-2-Q	2.0	0.00	70	0	0	451	6
1-295-1-Q	3.0	0.00	90	90	0	528	999
1-328-1-Q	0.0	0.00	-1	0	0	160	-1
1-328-2-Q	0.0	0.00	-1	0	0	160	-1
1-328-4-Q	0.0	0.00	-1	0	0	160	-1

Use ID: T

01-138-1-T	0.5	0.00	100	100	30	16	999
02-138-1-T	0.5	0.00	100	100	30	15	999

1-138-1-T	0 5	0.00	100	100	30	15	999
1-145-1-T	1.5	0.00	100	100	30	48	999
1-169-2-T	1 5	0.00	100	100	30	49	999
1-311-2-T	0.5	0.00	100	100	30	60	999
2-145-1-T	1 5	0.00	100	100	30	48	999
2-169-2-T	1.5	0.00	100	100	30	49	999
2-311-2-T	0.5	0.00	100	100	30	67	999
3-311-2-T	0.5	0 00	100	100	30	67	999

Use ID: TS

01-100-1-TS	0.4	0.00	100	100	40	87	999
01-145-2-TS	0.1	0.00	100	100	90	70	999
01-162-1-TS	0.1	0.00	100	100	90	96	999
01-261-2-TS	0 1	0.00	100	100	90	38	999
02-100-3-TS	0 1	0.00	100	100	90	71	999
02-145-2-TS	0.1	0.00	100	100	30	72	999
02-162-1-TS	0.1	0.00	100	100	90	96	999
03-129-1-TS	0.1	0.00	100	100	90	40	999
03-145-2-TS	0.1	0.00	100	100	90	70	999
03-165-1-TS	0.1	0.00	100	100	90	55	999
1-100-1-TS	0.1	0.00	100	100	90	87	999
1-145-2-TS	0.1	0.00	100	100	90	96	999
1-162-1-TS	0.1	0.00	100	100	90	76	999
1-213-2-TS	0.1	0.00	100	100	90	38	999
1-255-2-TS	0.1	0.00	100	100	90	128	999
1-278-2-TS	0 0	0.00	100	100	90	40	999
2-105-1-TS	0.1	0.00	100	100	90	38	999
2-145-2-TS	0.1	0.00	100	100	90	66	999
2-162-1-TS	0.1	0.00	100	100	90	112	999
2-210-2-TS	0.1	0.00	100	100	90	104	999
2-256-1-TS	0.1	0.00	100	100	90	56	999
2-256-2-TS	0.1	0.00	100	100	90	105	999
2-275-2-TS	0.1	0.00	100	100	90	104	999
2-279-1-TS	0 1	0.00	100	100	90	36	999

Use ID: TU

01-145-0-TU	1 0	0.00	30	20	5	512	-1
01-162-0-TU	1 0	0.00	30	20	5	512	-1
02-145-0-TU	1.0	0.00	30	20	5	512	-1
02-162-0-TU	1.0	0.00	30	20	5	512	-1
03-145-0-TU	1.0	0.00	30	20	5	518	-1
03-162-0-TU	1 0	0.00	30	20	5	505	-1
04-145-0-TU	1.0	0.00	30	20	5	512	-1
04-162-0-TU	1 0	0.00	30	20	5	512	-1
1-145-0-TU	1.0	0.00	30	20	5	512	-1
1-162-0-TU	1.0	0.00	30	20	5	512	-1
2-145-0-TU	1.0	0.00	30	20	5	505	-1
2-162-0-TU	1.0	0.00	30	20	5	512	-1

Use ID: U

1-49-7-U	0 0	0.00	-1	0	0	172	-1
3-145-1-U	0.0	0.00	-1	0	0	237	-1
3-162-2-U	0 0	0.00	-1	0	0	243	-1
3-46-1-U	0.0	0.00	-1	0	0	1010	-1
3-46-2-U	0 0	0.00	-1	0	0	1010	-1
5-45-0-U	0.0	0.00	-1	0	0	11	-1

Use ID: W

01-178-0-W	0.0	0.00	-1	0	0	1376	-1
01-178-2-W	0.0	0.00	-1	0	0	560	-1
01-178-3-W	0.0	0.00	-1	0	0	560	-1
02-178-2-W	0 0	0.00	-1	0	0	720	-1
02-178-3-W	0.0	0.00	-1	0	0	560	-1
2-014-0-W	0 0	0.00	-1	0	0	189	-1
4-262-0-W	0.0	0.00	0	0	0	81	-1
4-31-0-W	0.0	0.00	-1	0	0	198	-1
4-311-0-W	0.0	0.00	-1	0	0	1518	-1

APPENDIX F

Compartment Ventilation Factors on the PIR

Appendix F is an alphabetical listing of compartments by Use Indicator ordered by Compartment ID within each Indicator. Parameters listed include ventilation factors.

Glossary

Vent Area - An estimated size for the sum of the area of all vents in the compartment excluding doors and hatches.

Vent Height - An estimated size for the sum of the heights of all vents in the compartment excluding doors and hatches.

Exch. - Time in minutes required for a complete exchange of air in the compartment when the ventilation system is operating.

Flow - Air flow in the compartment in cubic feet per minute. (Compartment volume / air exchange time above)

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COMPARTMENT VENTILATION
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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Compt ID	Compartment Name	Vent Area (sqin)	Vent Ht. (in)	#of drs/ htch	Compt. Vol. (cu.ft)	Exch. (min)	Flow (CFM)
Use ID: AA							
2-49-0-AA	SCIENCE STORAGE--UPP	100	20	11	27069	10	2,706
3-311-0-AA	SCIENCE STORAGE--AFT	100	20	3	20583	10	2,058
3-49-0-AA	CARGO HOLD	100	20	1	15480	10	1,548
Use ID: AG							
01-162-5-A	ARCTIC GEAR LOCKER--	10	1	1	1638	10	163
01-218-3-A	GEAR LOCKER	10	1	1	424	10	42
01-218-4-A	GEAR LOCKER	10	1	1	372	10	37
01-255-8-A	XFMR FECT HELO	10	1	1	256	10	25
02-158-2-A	GEAR LOCKER	10	1	1	216	10	21
03-157-2-A	GEAR LOCKER	10	1	1	243	10	24
03-162-1-A	GEAR LOCKER	10	1	1	189	10	18
04-126-4-A	GEAR LOCKER	10	1	1	238	10	23
1-210-3-A	GEAR LOCKER	10	1	1	117	10	11
1-217-2-A	C.G. LOCKER	10	1	1	291	10	29
1-218-2-A	C.G. LOCKER	10	1	1	478	10	47
1-307-2-A	ARCTIC GEAR LOCKER--	10	1	2	2862	10	286
2-100-3-A	GEAR LOCKER	10	1	1	196	10	19
2-100-5-A	STACK CHAIR LOCKER	10	1	1	180	10	18
2-148-1-Q	ATHLETIC GEAR LOCKER	10	1	1	180	10	18
2-157-2-A	GEAR LOCKER	10	1	1	172	10	17
2-343-2-A	BOSN'S LOCKER	10	1	1	2722	5	544
2-49-1-A	SEA BAG LOCKER	10	1	1	1512	10	151
Use ID: AR							
1-255-1-A	REEFER	0	0	1	4160	1	
1-49-3-A	FROZEN STOREROOM NO.	0	0	1	5580	1	
1-61-1-A	THAW STOREROOM	0	0	4	1463	1	
1-61-3-A	CHILL STOREROOM	0	0	1	3744	1	
1-81-1-A	FROZEN STOREROOM NO.	0	0	1	5509	1	
Use ID: AS							
01-153-1-A	STOREROOM	10	1	1	498	10	49
01-218-8-A	SCIENCE BAGGAGE ROOM	10	1	1	1704	10	170
01-255-10-A	STOREROOM	10	1	1	640	10	64
02-145-1-A	STOREROOM	10	1	1	864	10	86
02-162-2-A	STOREROOM	10	1	1	864	10	86
03-132-2-A	ELECTRONIC STOREROOM	2000	90	1	5863	8	698
03-147-1-A	STOREROOM	10	1	1	631	4	157
03-157-1-A	STOREROOM	10	1	1	243	10	24
1-154-1-A	STOREROOM	10	1	1	624	10	62
1-162-6-A	SHIP STORE STOREROOM	10	1	1	1183	10	118
1-207-1-A	STOREROOM	10	1	1	728	3	242
1-4-0-A	STOREROOM	2000	90	3	7945	5	1,589
1-49-4-A	STOREROOM	2000	90	2	9122	5	1,824
1-64-2-A	DRY PROVISION STORER	2000	90	3	9425	6	1,570

1-89-4-A	SODA STORAGE 1000 CA	500	90	1	1430	5	286
2-154-1-A	STOREROOM	10	1	1	421	10	42
2-195-1-A	ELECTRICAL STOREROOM	175	90	1	2268	10	226
2-22-0-A	STOREROOM	20	2	4	11470	0	1,147
2-343-0-A	HAWSER STORES & SCIE	2000	90	4	767	0	767
2-388-2-A	STOREROOM	175	90	1	2052	10	205
2-4-0-A	STOREROOM	175	90	1	4452	10	445
2-65-1-Q	ENGINEERING STOREROO	175	90	1	5275	7	754
3-22-0-A	STOREROOM	20	2	1	7406	10	740
Use ID: C							
01-319-0-C	SCIENCE & WINCH CONT	175	90	2	7164	4	1,791
04-108-0-C	PILOT HOUSE	300	90	5	15359	4	3,267
1-223-0-C	AFT REPAIR NO.3 & DA	175	90	3	7904	5	1,580
2-223-0-C	ENGINEERING CONTROL	250	90	4	14957	2	7,478
2-343-3-C	AFT REPAIR NO.2	175	90	1	4021	5	804
2-55-2-C	FORWARD REPAIR NO.3	175	90	1	5278	5	1,055
Use ID: E							
1-178-1-E	BOILER ROOM UPPER LE	500	70	2	9141	2	4,570
1-178-2-E	BOILER ROOM UPPER LE	500	70	2	9141	2	4,570
2-178-1-E	BOILER ROOM	500	70	1	6307	2	3,153
2-361-2-E	STEERING GEAR ROOM	500	70	2	6325	3	2,108
3-100-0-E	ENGINE ROOM NO.1	2100	70	4	31201	1	31,201
3-162-0-E	ENGINE ROOM NO.2	2100	70	3	34328	1	34,328
3-223-0-E	MOTOR GENERATOR ROOM	500	70	4	26880	3	8,960
3-271-0-E	AUXILIARY MACHINERY	500	70	3	31798	2	15,899
4-100-0-E	ENGINE ROOM NO.1	2100	70	1	31263	1	31,263
4-223-0-E	MOTOR ROOM	1000	70	2	26069	6	4,344
4-271-0-E	PUMP ROOM	500	70	1	16159	6	2,693
5-49-0-E	BOW THRUSTER MACHINE	500	70	2	4109	3	1,369
5-76-0-E	BOW THRUSTER MACHINE	500	70	2	5568	3	1,856
Use ID: K							
1-028-0-K	FLAMMABLE LIQUIDS ST	10	1	1	7488	4	1,872
Use ID: L							
01-146-3-L	OFFICER SR	175	90	2	1778	5	355
02-100-2-L	CO CABIN	175	90	3	3445	9	382
1-174-1-L	MEDICAL TREATMENT &	400	90	6	5384	5	1,075
1-199-1-L	MEDICAL STORES	175	90	2	1436	10	143
Use ID: L1							
01-225-0-L	SCIENTIST SR	175	90	2	1169	5	233
02-100-4-L	CO SR	175	90	2	3379	9	375
02-100-5-L	CHIEF SCIENTIST SR	175	90	2	3820	9	424
02-120-2-L	OFFICER SR	175	90	2	2600	8	325
02-120-6-L	VISITOR SR	175	90	2	3061	8	382
02-122-3-L	OFFICER SR	175	90	2	2736	8	342
02-136-3-L	OFFICER SR	175	90	2	1888	8	236
02-136-4-L	OFFICER SR	175	90	2	2098	8	262
02-146-1-L	OFFICER SR	175	90	2	2242	8	280

04-132-2-L	SEA CABIN	175	90	1	1165	5	233

Use ID: L10

2-100-2-L	CREW BERTHING	250	90	2	3375	6	562
2-100-4-L	CREW BERTHING	250	90	2	3621	6	603
2-121-3-L	CREW BERTHING	250	90	2	2876	6	479
2-121-4-L	CREW BERTHING	250	90	2	3223	6	537
2-271-2-L	CREW BERTHING	250	90	2	2210	5	442
2-271-5-L	CREW BERTHING	250	90	2	3435	5	687
2-271-6-L	CREW BERTHING	250	90	2	2794	5	558

Use ID: L2

01-100-3-L	OFFICER SR	175	90	2	2575	5	515
01-100-4-L	CPO BERTHING	175	90	2	1860	5	372
01-113-2-L	CPO BERTHING	175	90	2	1620	5	324
01-118-3-L	OFFICER SR	175	90	2	2030	5	406
01-125-4-L	CPO BERTHING	175	90	2	1680	5	336
01-132-3-L	OFFICER SR	175	90	2	1434	5	286
01-162-6-L	CPO BERTHING	175	90	2	1487	5	297
01-222-1-L	SCIENTIST SR	175	90	2	1841	5	368
01-222-2-L	SCIENTIST SR	175	90	2	1311	5	262
01-239-3-L	SCIENTIST SR	175	90	2	1650	5	330
01-239-4-L	SCIENTIST SR	175	90	2	1650	5	330
01-255-0-L	SCIENTIST SR	175	90	2	1375	5	275
01-255-2-L	SCIENTIST SR	175	90	2	1508	5	301
01-255-3-L	SCIENTIST SR	175	90	2	1493	5	298
01-271-1-L	SCIENTIST SR	175	90	2	2297	5	459
01-271-4-L	SCIENTIST SR	175	90	3	1526	5	305
01-271-8-L	SCIENTIST SR	175	90	2	2041	5	408
01-277-5-L	SCIENTIST SR	175	90	2	1922	5	384
01-292-4-L	SCIENTIST SR	175	90	2	1488	5	297
01-292-8-L	SCIENTIST SR	175	90	2	1801	5	360
01-311-6-L	SCIENTIST SR	175	90	2	1353	5	270
02-148-2-L	OFFICER SR	175	90	2	1889	8	236
02-162-3-L	OFFICER SR	175	90	2	2457	5	491
02-162-6-L	OFFICER SR	175	90	2	2520	5	504
1-162-7-L	WARD NO.1	175	90	1	1181	3	393
1-174-3-L	WARD NO.2	175	90	1	1105	3	368

Use ID: L4

01-142-2-L	CPO BERTHING	225	90	2	2244	8	280
2-291-3-L	CREW BERTHING	225	90	2	1857	5	371

Use ID: L6

2-271-1-L	CREW BERTHING	275	90	2	2210	5	442
2-291-4-L	CREW BERTHING	275	90	2	1857	5	371
2-295-2-L	CREW BERTHING	275	90	2	2603	5	520
2-295-3-L	CREW BERTHING	275	90	2	2603	5	520

Use ID: L8

2-100-1-L	CREW BERTHING	325	90	2	2423	6	403

Use ID: LL							
01-100-0-LL	WARDROOM & LOUNGE	800	90	3	11824	4	2,956
02-100-1-LL	CO LOUNGE	400	90	4	4111	4	1,027
1-100-5-LL	CREW MESS	2000	70	2	16125	4	4,031
1-124-2-LL	CPO MESSROOM & LOUNG	800	90	2	9938	4	2,484
2-100-7-LL	CREW LOUNGE	2000	70	3	4917	4	1,229
2-134-1-LL	CREW STUDY	200	90	1	2204	4	551
Use ID: LP							
01-100-2-LP	PASSAGE	500	12	7	4462	5	892
01-114-1-LP	PASSAGE	1000	12	10	3774	5	754
01-162-2-LP	PASSAGE	250	12	2	1968	5	393
01-162-3-LP	PASSAGE	625	12	4	1440	5	288
01-176-1-LP	PASSAGE	250	12	2	2240	5	448
01-218-5-LP	PASSAGE	1125	12	9	4399	5	879
01-218-6-LP	PASSAGE	625	12	5	1381	5	276
01-239-6-LP	PASSAGE	500	12	6	1280	5	256
01-255-6-LP	PASSAGE	1000	12	8	2108	5	421
01-292-2-LP	PASSAGE	625	12	5	1756	5	351
02-115-1-LP	PASSAGE	1375	12	10	3052	5	610
02-121-2-LP	PASSAGE	1375	12	11	2854	5	570
02-178-1-LP	PASSAGE	250	12	2	1440	5	288
03-111-2-LP	PASSAGE	875	12	7	3011	5	602
03-140-1-LP	PASSAGE	1250	12	10	3482	5	696
1-100-0-LP	PASSAGE	375	12	3	3485	5	697
1-100-2-LP	PASSAGE	1125	12	9	3187	5	637
1-100-3-LP	PASSAGE	1125	12	10	3187	5	637
1-162-2-LP	PASSAGE	750	12	6	3372	5	674
1-162-3-LP	PASSAGE	1500	12	13	5265	5	1,053
1-207-2-LP	PASSAGE	1000	12	9	2412	5	482
1-223-2-LP	PASSAGE	1750	12	13	4992	5	998
1-239-1-LP	PASSAGE	500	12	3	499	5	99
1-319-0-LP	PASSAGE	125	12	1	4518	5	903
1-49-1-LP	PASSAGE	750	12	6	5683	5	1,136
1-49-2-LP	PASSAGE	1125	12	10	6929	5	1,385
1-52-0-LP	PASSAGE	500	12	5	6552	5	1,310
2-100-0-LP	PASSAGE	2625	12	21	8724	5	1,744
2-162-2-LP	PASSAGE	1125	12	9	3580	5	716
2-162-3-LP	PASSAGE	1375	12	11	3020	5	604
2-223-1-LP	PASSAGE	750	12	6	1854	5	370
2-223-2-LP	PASSAGE	625	12	4	1728	5	345
2-271-3-LP	PASSAGE	875	12	8	2404	5	480
2-271-4-LP	PASSAGE	1125	12	8	2383	5	476
Use ID: LW							
01-106-2-LW	WR WC & SHR	175	90	1	480	4	120
01-111-1-LW	WR WC & SHR	175	90	1	665	4	166
01-117-2-LW	WR WC & SHR	175	90	1	540	4	135
01-118-1-LW	WR WC & SHR	175	90	1	400	4	100
01-125-2-LW	WR WC & SHR	175	90	1	480	4	120
01-132-1-LW	WR WC & SHR	175	90	1	330	4	82
01-146-1-LW	WR WC & SHR	175	90	1	462	4	115
01-154-2-LW	WR WC & SHR	175	90	1	458	4	114

01-162-4-LW	WR WC & SHR	150	90	1	385	4	96
01-218-1-LW	WC & SHR	175	90	1	424	4	106
01-218-2-LW	WC & SHR	175	90	1	476	4	119
01-222-0-LW	WC & SHR	175	90	1	270	4	67
01-239-1-LW	WC & SHR	150	90	1	270	4	67
01-239-2-LW	WC & SHR	150	90	1	270	4	67
01-255-1-LW	WC & SHR	150	90	1	225	4	56
01-255-4-LW	WC & SHR	150	90	1	252	4	63
01-255-5-LW	WC & SHR	150	90	1	297	4	66
01-271-6-LW	WR WC & SHR	150	90	2	387	4	96
01-277-1-LW	WC & SHR	150	90	1	250	4	62
01-277-3-LW	WC & SHR	150	90	1	250	4	62
01-278-2-LW	WR WC & SHR	175	90	1	392	4	98
01-292-6-LW	WR WC & SHR	175	90	1	343	4	85
01-298-2-LW	WR WC & SHR	175	90	1	416	4	104
01-311-4-LW	WR WC & SHR	175	90	1	380	4	95
02-113-2-LW	WR WC & SHR	175	90	1	567	4	141
02-116-1-LW	WR WC & SHR	175	90	1	432	4	108
02-120-4-LW	WR WC & SHR	175	90	1	567	4	141
02-122-1-LW	WR WC & SHR	175	90	1	526	4	131
02-132-2-LW	WR WC & SHR	175	90	1	526	4	131
02-136-1-LW	WR WC & SHR	150	90	1	381	4	95
02-136-2-LW	WR WC & SHR	150	90	1	381	4	95
02-152-2-LW	WR WC & SHR	175	90	1	648	4	162
02-154-1-LW	WR WC & SHR	175	90	1	459	4	114
02-162-4-LW	WR WC & SHR	175	90	1	532	4	133
02-171-1-LW	WR WC & SHR	175	90	1	567	4	141
03-117-2-LW	WR & WC	150	90	1	297	4	74
04-126-2-LW	WR & WC	175	90	1	323	4	80
1-100-4-LW	WR & SHR	175	90	1	338	4	84
1-162-5-LW	WARD BATH	200	90	1	1274	4	318
1-213-1-LW	WC & WR	175	90	1	374	4	93
1-302-2-LW	WTR WC & SHR	175	90	1	455	4	113
2-111-1-LW	WR WC & SHR	175	90	1	726	4	181
2-111-2-LW	WR WC & SHR	200	90	1	945	4	236
2-121-1-LW	WR WC & SHR	200	90	1	945	4	236
2-121-2-LW	WR WC & SHR	200	90	1	945	4	236
2-125-2-LW	WR WC & SHR	200	90	1	900	4	225
2-281-1-LW	WR WC & SHR	175	90	1	669	4	167
2-281-2-LW	WR WC & SHR	175	90	1	669	4	167
2-284-1-LW	WR WC & SHR	200	90	1	1044	4	261
2-284-2-LW	WR WC & SHR	200	90	1	1094	4	273
2-291-1-LW	WR WC & SHR	150	90	1	360	4	90
2-291-2-LW	WR WC & SHR	150	90	1	360	4	90
2-295-1-LW	WR WC & SHR	175	90	1	450	4	112
2-295-4-LW	WR WC & SHR	175	90	1	450	4	112

Use ID: M

1-210-0-M	SMALL ARMS STOW & RE	10	1	1	2046	4	511
2-61-1-M	SMALL ARMS & DEM MAG	10	1	1	1203	4	300

Use ID: Q .

01-126-1-Q	OFFICER PANTRY	175	90	3	2594	0	6,485
01-311-2-Q	HOIST EQPT ROOM	10	1	1	648	2	324
02-129-1-Q	PANTRY	175	90	2	2131	0	5,328

02-228-0-Q	HANGAR	0	0	1	18972	6	3,162
03-105-0-Q	RADIO ROOM	225	90	3	11817	4	2,954
03-105-1-A	ELECTRONIC EQUIPMENT	175	90	1	10485	0	17,475
03-106-2-A	ELECTRONIC SHOP	175	90	1	6075	10	607
03-154-1-Q	HAM SHACK	175	90	1	597	5	119
1-105-0-Q	GALLEY	225	90	4	15411	8	1,926
1-119-1-Q	SCULLERY	225	90	2	2366	2	1,183
1-132-1-Q	INCINERATOR ROOM	10	1	1	3320	2	1,660
1-162-4-Q	SHIP STORE	175	1	2	2666	9	296
1-199-3-L	X-RAY DARKROOM	175	90	1	607	2	303
1-22-0-Q	ANCHOR WINDLASS MACH	10	1	3	20920	10	2,092
1-239-2-A	PHOTO LAB	200	90	1	1664	10	166
1-245-1-Q	SCIENCE REEFER MACHY	10	1	1	1060	2	530
1-255-0-Q	ELECTRONICS LAB	175	90	1	3744	6	624
1-271-2-Q	RECOMPRESSION AREA &	225	90	4	6832	7	976
1-4-2-Q	BOW BOOM INSTRUMENT	175	90	1	2197	2	1,098
1-49-5-Q	REEFER MACHINERY ROO	10	1	1	4157	2	2,078
2-148-3-Q	WEIGHT ROOM & GYM	225	90	2	1944	5	388
2-162-4-Q	MACHINE SHOP	775	90	2	5459	3	1,819
2-162-5-Q	SHIP LAUNDRY	400	90	1	2867	2	1,433
2-180-1-Q	SELF-SERVICE LAUNDRY	200	90	1	2592	3	864
2-195-2-Q	FIREFIGHTING EQPT RO	10	1	1	4408	5	881
2-205-1-Q	ELECTRIC SHOP	175	1	1	2172	5	434
2-210-0-Q	GRAVIMETER ROOM	10	1	1	1008	2	504
2-223-3-Q	ELECTRICAL EQUIPMENT	175	90	1	7235	5	1,447
2-223-4-Q	ELECTRICAL EQUIPMENT	175	90	1	7235	5	1,447
2-251-2-A	BATTERY ROOM	10	1	1	315	2	157
2-262-1-Q	IC/GYRO ROOM	10	1	1	2180	2	1,090
2-311-0-Q	WINCH ROOM	10	1	6	23264	2	11,632
2-95-2-Q	FWD IC/GYRO ROOM	10	1	1	346	2	173

Use ID: QF

01-239-8-A	FAN ROOM	10	1	1	1280	2	640
03-162-2-Q	FAN ROOM	10	1	1	4408	2	2,204
03-162-3-Q	FAN ROOM	10	1	1	2736	2	1,368
1-49-0-Q	FAN ROOM	10	1	1	3070	2	1,535
2-262-2-QF	FAN ROOM	10	1	1	1698	2	849

Use ID: QO

01-271-2-Q	SCIENTIST LIBRARY/CO	225	90	4	6504	7	929
02-218-0-QO	HELO EQUIP ROOM & OF	200	90	2	3960	6	660
04-126-0-Q	METEROLOGY LAB & CHA	225	90	7	6135	3	2,045
1-100-6-Q	SHIP LIBRARY	200	90	1	5824	8	728
1-178-4-QO	SUPPLY OFFICE	175	90	3	2152	7	307
1-178-6-QO	SUPPLY OFFICER OFFIC	175	90	1	1188	7	169
1-187-2-QO	1ST LT OFFICE	175	90	1	1638	7	234
1-198-2-QO	SHIP OFFICE	175	90	2	2931	6	488
1-206-2-QO	EXO OFFICE	175	90	1	1638	7	234
1-210-1-Q	BARBER SHOP	175	90	1	1393	4	348
1-210-2-Q	MAIL ROOM	175	90	1	832	7	118
1-89-2-QO	COMMISSARY OFFICE	175	90	1	1144	6	190
2-130-2-QO	EXO OFFICE	175	90	1	2430	6	405
2-146-2-Q	ENGINEERING LOG & DA	175	90	1	2640	6	440
2-210-01-Q	COMPUTER/NAV LAB	175	90	2	3672	2	1,836

Use ID: QS							
01-312-2-Q	SCIENTIST COMM CENTE	175	90	1	528	9	58
1-239-0-Q	DRY LAB	200	90	2	6344	4	1,586
1-271-0-Q	WET LAB	200	90	3	10192	4	2,548
1-287-2-Q	WET LAB NO.2	200	90	3	5865	4	1,466
1-295-1-Q	VESTIBULE	200	90	4	6864	5	1,372
Use ID: T							
01-138-1-T	DUMB WAITER	10	1	1	160	2	80
02-138-1-T	DUMB WAITER	10	1	1	136	2	68
1-138-1-T	DUMB WAITER	10	1	1	197	2	98
1-145-1-T	MACHINERY HOIST ROOM	10	1	2	624	2	312
1-169-2-T	MACHINERY HOIST ROOM	10	1	2	647	2	323
1-311-2-T	ELEVATOR	10	1	3	790	2	395
2-145-1-T	MACHINERY HOIST	10	1	3	432	2	216
2-169-2-T	MACHINERY HOIST	10	1	3	448	2	224
2-311-2-T	ELEVATOR	10	1	2	604	2	302
3-311-2-T	ELEVATOR TRUNK	10	1	2	672	2	336
Use ID: TS							
01-100-1-TS	STAIRCASE	10	1	3	870	5	174
01-145-2-TS	STAIRCASE	10	1	2	702	5	140
01-162-1-TS	STAIRCASE	10	1	3	960	5	192
01-261-2-TS	STAIRCASE	10	1	3	384	5	76
02-100-3-TS	STAIRCASE	10	1	3	642	5	128
02-145-2-TS	STAIRCASE	10	1	4	648	5	129
02-162-1-TS	STAIRCASE	10	1	4	864	5	172
03-129-1-TS	STAIRCASE	10	1	2	360	5	72
03-145-2-TS	STAIRCASE	10	1	2	631	5	126
03-165-1-TS	STAIRCASE	10	1	2	497	5	99
1-100-1-TS	STAIRCASE	10	1	3	1131	5	226
1-145-2-TS	STAIRCASE	10	1	3	1248	5	249
1-162-1-TS	STAIRCASE	10	1	3	990	5	198
1-213-2-TS	STAIRCASE	10	1	2	499	5	99
1-255-2-TS	STAIRCASE	10	1	3	1664	5	332
1-278-2-TS	STAIRCASE	10	1	2	520	5	104
2-105-1-TS	STAIRCASE	10	1	3	342	5	68
2-145-2-TS	STAIRCASE	10	1	3	594	5	118
2-162-1-TS	STAIRCASE	10	1	3	1008	5	201
2-210-2-TS	STAIRCASE	10	1	3	936	5	187
2-256-1-TS	STAIRCASE	10	1	2	507	5	101
2-256-2-TS	STAIRCASE	10	1	6	951	5	190
2-275-2-TS	STAIRCASE	10	1	4	936	5	187
2-279-1-TS	STAIRCASE	10	1	2	324	5	64

311 = Total number of compartments with doors or hatches

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APPENDIX G

Calculation of Full Room Involvement Time

A Summary Report on the McCaffrey Method
for Predicting Compartment Full Room Involvement Time

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Flashover is predicted when the temperature rise of the gas in the upper layer of the room **exeeds** 500°C. In order to determine when these temperatures are achieved, one needs to know the value of the dependent variables as a function of time. In other words, if we know the value of the fire s heat release rate, the mass flow rate of hot gases out of the compartment and the compartment s wall heat losses for all values of time, then the time at which these variables yield a temperature rise of 500°C will be the time of flashover.

McCaffrey s equation for predicting flashover is:

$$T_g - T_\infty = 1.6 \cdot T_\infty \left[\frac{Q}{\sqrt{g}\,(\rho \cdot T \cdot C_p)_\infty (A \cdot \sqrt{H})_o} \right]^{2/3} \cdot \left[\frac{h \cdot A}{\sqrt{g} \cdot (\rho \cdot C_p)_\infty (A \cdot \sqrt{H})_o} \right]^{-1/3} \qquad (1)$$

The terms ρ, C_p and T_∞ are the density, heat capacity, and temperature of the ambient air. Consistent units should be used with this equation.

Equation 1 may be simplified if we use constant quantities for the ambient temperature, density and heat capacity.

$$T_g - T_\infty = 6.85 \cdot \left[\frac{Q^2}{(h \cdot A) \cdot (A \cdot \sqrt{H})_o} \right]^{1/3} \qquad (2)$$

Here we assume that T_∞, ρ_∞, g and C_p equal 295K, 1.2kg/m³, 9.8m/s², and 1.05 kJ/kg·k, respectively. The heat release rate, Q, and the heat transfer coefficient must be expressed in the units of kW and kW/m²·k. This is because the coefficient 6.85 cancels these and only these units. The temperatures difference is expressed in either degrees Centigrade or Kelvin, and the length measurements are in meters.

The following text explains how to produce a numerical answer for a flashover prediction using the McCaffrey model. Whether one wishes to use equation (1) or equation (2) is a matter of personal preference. The advantage to equation (1) is that it may be used with any **consistent** set of units. The advantage of equation (2) is its simplicity.

HEAT RELEASE RATE Q

Q, the heat release rate, may be entered either digitally or implicitly as a function of time. If Q is to be entered digitally, then it can be done so in an array such as might appear below.

Q ($W \cdot 10^3$)	t (s)
100	100
3000	200
60000	300
...	...
...	...

An acceptable function of Q as a function of time appears as

$$Q = \alpha(t-t_0)^2 \qquad (3)$$

HEAT TRANSFER COEFFICIENT...h

The heat transfer coefficient represents the energy losses through the compartments boundry layer due to convection and radiation. It can model both transient and steady-state heat conduction, as well as account for these losses through walls consisting of more than one layer of material.

The term, $(h \cdot A)_{total}$, is really an arithmetic sum of the heat transfer coefficient terms for each of the bounding surfaces of the compartment.

$$h \cdot A_{total} = \sum_i (h \cdot A)_i \qquad (4)$$

This formula, in effect weighs the heat transfer coefficient by the area across which the conductive heat transfer is occuring. The reason for this is that different materials will conduct heat at different rates. If a room has metal bulkheads for walls, but has a wooden floor, the above equation will emphasize the importance of the conduction through the metal walls because the surface area of the walls is greater than the surface area of the floor.

The area, A_i, therefore applies only to that area for which the heat transfer coefficient, h_i, was calculated for. $Area_i$ could be for an entire wall if that wall consisted of metal bulkheads or the entire wall could be divided into two A_i's each one-half of the original wall area if that wall was, say, half built of brick and half built with plywood sheets. If a wall has a vent to the ambient

atmosphere, then the vent area should be subtracted from the surface area of the barrier in which it is located.

For a surface consisting of multiple layers of different materials, then the individual heat transfer coefficient for that surface is

$$h = \left[\sum_i \frac{1}{h_i} \right]^{-1} \qquad (5)$$

where h_i is the heat transfer coefficient for each layer.

To calculate the heat transfer coefficient for each layer it is first necessary to calculate the thermal penetration time for that layer. This is because the heat transfer coefficient may be calcualed by either of two formulas, transient or steady state. The thermal penetration time, t_p, is expressed as

$$t_p = \frac{\rho \cdot C_p \cdot \delta^2}{4k} \qquad (6)$$

Here ρ, C_p, k and δ are the density, heat capacity, thermal conductivity and thickness of the surface layer material in question.

When it is early in the fire, the heat transfer rate through the surface layer will be highest, and so the heat transfer is calculated by the transient formula (which yields higher heat transfer rates). After the heat has penetrated through the layer, which is after the thermal penetration time of that layer, the heat transfer rate will be lower, and hence the steady state formula is used.

So, at times less than a surface's thermal penetration time, we use the transient model to calculate its heat transfer coefficient (h_i). After the thermal penetration time, we use the steady state model. The formulas for both the transient and the steady state models appear in equations (7) and (8).

transient: (7)

for the compartment's innermost layer (that visable to the occupants)

$$h_i = \frac{[C_p k \rho]^{1/2}}{t^{1/2}} \quad \text{for } 0 \le t \le t_{p,i}$$

steady-state (8)

$$h_i = \frac{k}{\delta}^{1/2} \quad \text{for } t_{p,i} \le t$$

VENT DIMENSIONS···A_o, H_o

These variables are simply the area and height of the vents.

$$A_o\sqrt{H_o} = \text{Area}\cdot(\text{Height})^{1/2} \qquad (9)$$

If more than one vent exists in a compartment, the vent factor is the sum of the individual vent factors for each opening.

$$(A\sqrt{H})_o = \sum_i (A_o\sqrt{H_o})_i \qquad (10)$$

AMBIENT DATA AND PHYSICAL CONSTANTS

EXAMPLE

HEAT RELEASE RATE

Here an example is presented of how to predict flashover in a room.

The room is square with walls 3.0 meters on a side and a doorway in the middle of one wall. The doorway stands 2.0m high and 0.8m wide. The ceiling is 2.5 meters above the floor. The ceiling is constructed of 16mm gypsum board; The walls are made of concrete blocks, 7.62cm thick, and the floor is 50cm of concrete.

Since we have all the length dimensions of the room, lets solve for the areas of the interior surfaces (across which heat transfer will occur), and for the vent area (through which heat convection will occur).

$$A_{ceiling} = 9 \text{ m}^2$$
$$A_{floor} = 9 \text{ m}^2$$
$$A_{walls} = 4\cdot(2.5\cdot3.0) - 2.0 \text{ m}^2 = 28.0 \text{ m}^2$$

$$(A\sqrt{H})_o = 0.8\cdot2.5^{3/2} = 3.162 \text{ m}^{5/2}$$

The fire's heat release rate will be predicted as an explicit function of time.

$$Q = \alpha(t-t_v)^2 \qquad (11)$$

$$Q = 1.0(t-30)^2$$

The virtual time is thirty seconds. This is the time before the fire produces any significant measureable heat release. Alpha is 1 Watt/second^2.

Now lets solve for the ambient air physical properties.

$$\rho_\infty = 1.2 \text{ kg/m}^3 \qquad (12)$$

$$k = 0.025 \text{ W/m}^2$$

$$C_p = 1.038 \text{ kJ/kg}\cdot\text{K}$$

All these values are for air (T_∞) at 295K.

Here are the physical properties of the wall materials. Concrete was evaluated at 100°C. The other materials were evaluated at 300°C.

Material	thermal conductivity	density	heat capacity	thickness
	W/m^2·K	kg/m^3	J/kg·K	m
Type-X Gypsum	0.13	770	900	0.016
Concrete	1.7	2200	1200	0.5
Concrete Block	1.7	2200	1200	0.0762

Now, we will solve for the heat transfer coefficients. First we must determine the thermal penetration time of all the materials for each bounding surface (equation 6). Then we determine both the steady-state and the transient coefficients for each material (equation 7 and 8). Next, we determine the effective surface heat transfer coefficient for each time interval as stipulated by the thermal penetration times (equation 5). When these surface heat transfer coefficients are then multiplied by their respective areas and summed, the overall heat transfer coefficient term is determined (equation 4).

Thermal Penetration time:

Ceiling:
Type-X Gypsum

$$t_p = \frac{770 \cdot 800}{0.13} \cdot \frac{(0.016)^2}{4}$$

$$= 303.26 \text{ s}$$

Floor:
Concrete

$$t_p = \frac{2200 \cdot 1200}{1.7} \cdot \frac{(0.5)^2}{4}$$

$$= 97\ 060 \text{ s}$$

Walls:
Concrete Block
(normal weight)

$$t_p = \frac{2200 \cdot 1200}{1.7} \cdot \frac{(0.0762)^2}{4}$$

$$t_p = 2254 \text{ s}$$

Surface Heat Transfer Coefficients:

Ceiling:

$0 \le t \le 303.3$ $\quad h = \frac{283}{\sqrt{t}}$

$303.3 < t$ $\quad h = \frac{0.13}{0.016}$

Floor:

$0 \le t \le 97060$ $\quad h = \frac{2118}{\sqrt{t}}$

$97060 < t$ $\quad h = \frac{1.7}{0.5}$

Walls:

$0 \le t \le 2254$ $\quad h = \frac{2118}{\sqrt{t}}$

$2254 < t$ $\quad h = \frac{1.7}{0.0762}$

Overall Heat Transfer Coefficients

$\sum_i (h \cdot A)_i$

$0 \le t \le 303.3$

$$h \cdot A_t = \frac{283}{\sqrt{t}} \cdot 9 + \frac{2118}{\sqrt{t}} \cdot 9 + \frac{2118}{\sqrt{t}} \cdot 28.4$$

$$= \frac{81778}{\sqrt{t}}$$

$303.3 < t \le 2254$

$$h \cdot A_t = \frac{0.016}{0.13} \cdot 9 + \frac{2118}{\sqrt{t}} \cdot 9 + \frac{2118}{\sqrt{t}} \cdot 28.4$$

$$= 73.13 + \frac{79213}{\sqrt{t}}$$

$2254 < t \le 97060$

$$h \cdot A_t = 73.13 + \frac{2118}{\sqrt{t}} \cdot 9 + \frac{1.7}{.0762} \cdot 28.4$$

$$= 706.7 + \frac{19062}{\sqrt{t}}$$

$97060 < t$

$$h \cdot A_t = 706.3 + \frac{1.7}{0.5} \cdot 9$$

$$= 737.32$$

Here $h \cdot A_t$ has the units of W/K. For presentation purposes some of the above numbers were rounded off. More accuracy is carried out in the columns of calculations following this report. Now that we have calculated the overall heat transfer coefficients, the examples on how all the variables are calculated is finished, except of course, for the hot layer temperatures.

OBTAINING NUMERICAL SOLUTIONS TO THE UPPER LAYER TEMPERATURES

Using equation 2, and the constant values assumed in equation 12, we can solve for the upper layer temperature as a function of time. Bear in mind that flashover is predicted when the upper layer temperature rises above 500°C.

```
 Fire:      Q = .001 kW/s^2 * (t-30sec)^2
constants: p = 1.2kg/m^3     Cp = 1038 J/kg/K
           g = 9.807 m/s^2
vent parameter:
  AoHo^(./2) = 2.263 m^(5/2)
Temperature rise
T gas - Tamb = (Q 2/((h*A)/1000*AoHo^(1/2)))^(1/3)
```

Using equation # 2 to predict the time of flashover

time seconds	Q kW	(h*A) tot W/K	T gas-Tamb oei K	
1	0	81778.3	0.00055	
40	0.1	12930.2	0.47893	
80	2.5	9143.10	4.59629	
150	14.4	6677.17	16.4004	
250	48.4	5172.11	40.0700	
500	220.9	3616.46	124.217	
1230	1440	2332.27	501.718	***flashover***
2500	6100.9	1088.04	1693.78	
100000	9994000.	737.321	267970.	

```
from time     0-303.6 seconds:   hA = 81778/sqrt(time)
from time 303.6-2254 seconds:    hA = 73.13+79213/sqrt(time)
from time 2245-97060 seconds:    hA = 706.73+19062/sqrt(time)
for  time     > 97060 seconds:   hA = 737.32
```

NOMENCLATURE		UNITS
A	area	m^2
α	constant	$Joules/s^2$
cm	centimeter	$m \cdot 10^{-2}$
C	heat capacity	$Joules/kg \cdot K$
g	gravitational acceleration	m/s^2
h	heat transfer coefficient	$W/m^2 \cdot K$
H	height of vent	m
k	thermal conductivity	$W/m \cdot K$
K	temperature	Kelvin
mm	millimeter	$m \cdot 10^{-6}$
ρ	density	kg/m^3
Q	heat release rate	W
s	seconds	seconds
t	time	s
t_p	thermal penetration time	s
T	temperature	K
W	Power	Watt

Subscripts

g	gas
∞	infinity
o	opening
p	constant pressure
t	total compartment area

An Estimation of Rate of Heat Release for Ship Compartments

In order to use the McCaffrey Method to predict the full room involvement time of each compartment on the PIR, an estimation of heat release rate (Q) was needed. Values for the relevent parameters were determined by careful comparisons of fifteen representative ship compartments with literature data. From these base sets, all four hundred compartments were evaluated by comparing each compartment with the base set. The remaining pages of this appendix describe the base set and the extrapolation procedures used.

The base set

The following list contains the fire growth descriptions for the base set of compartments. First, a short explanation of the parameters will be given.

alpha	the linear coefficient for the growth curve.
Q max	the maximum heat release rate for a compartment.
Q *	the normalized maximum heat maximum release (Q max/lb m of fuel)
t virt	the smoldering time of the fire before significant burning occurs (this parameter is ignored when considering established burning as the time of origin)
t crit	the duration of burning at Q max
t peak	the time from the first spark to Q max. (since this does not consider t virtual, t virtual will be subtracted from t peak).

Where it was not otherwise stated, the compartment fires considered the ventilation to be provided by at least a 2* by 6* foor hatchway.

This work is not definitive. Much work is left to complete in accurately estimating room fire behavior. Use the following data with criticism.

COMPARTMENT TYPE: ELECTRONICAL COMPONENTS ROOMS
Room Model 2-49-0-AA

fuel: polyethylene wire insulation, polysynthetics

model: alpha and Q max are the geometric average of three different sources (see appendix B for details)

alpha: 0.008 kW/s)

Q max: (Q *)/(lb m of fuel in room)

Q *: 13 kW/lb

NOTE: this is extremely large, especially when one considers the low alpha, on the other hand, the heat release of polypropylene is approximately 2.5 times that of cellulosics. It was derived from the geometric average of the above three citations. This result appears questionable.

t virt: 240 seconds
t peak: obtained from
t crit: varies 120-1800 seconds

COMPARTMENT: HANGING POLYURETHANES
Room 1-162-5-A

fuel: hanging polyurethanes, synthetic polymers

model: NBSIR 82-2649 (hanging clothes), NBSIR 83-2787 (hanging clothes) and VTT Research Report 285 (curtains).

alpha: 0.818 kW/s)

this was calculated considering the fuel loading on a room wide basis. However, it was 'integrated' from considering the single item burning rates given in the above articles. See appendix d for details.

Q max: (Q *)/(lb m of fuel in the room)

Q *: 18.3 kW/lbm see appendix d for details.

t virt: 0 seconds
t peak: 250 seconds (obtained from ')
t crit: 0 seconds

COMPARTMENT TYPE: HANGING CELLULOSICS

fuel: hanging cellulosics

model: NBSIR 82-2649 (hanging clothes), NBSIR 83-2787 (hanging clothes) and VTT Research Report 285 (curtains).

alpha: 0.0667 kW/s²

this was calculated considering the fuel loading on a room wide basis. However, it was 'integrated' from considering the single item burning rates given in the above articles. See appendix e for details.

Q max: (Q *)/(lb m of fuel in the room)

Q *: 16.9 kW/lbm see appendix e for details.

t virt: 0 seconds
t peak: obtained from
t crit: 15 seconds

COMPARTMENT TYPE: GREASY, SOOTY ENVIRONMENTS
Rooms: uptake compartments, machinery rooms

fuel: soot and grease

model: judgement and the other preceeding models

alpha: 0.18 kW/s²

Q̇ max: (Q̇ *)/(10 m of fuel in the room)

Q̇ *: 80 kW/lbm

see appendix E for sample calculations

t virt: 30 seconds
t peak: obtained from
t crit: judgement

COMPARTMENT TYPE: ENGINE ROOMS
Room 2-178-0-E

fuel: liquids (octanes or hydraulic fluids)

model: pool fire engineering method developed by Babrauskas Fire Technology vol. 19, issue 4, 1983, and a mass balance.

alpha: determined from calculations see appendix D table 1 for details (kW/s)

Q max: determined from calculations see appendix D table 1 for details (kW/m)

Q *: inapplicable

t virt: 0 seconds
t peak: determined from mass balance
t crit: judgement

COMPARTMENT TYPE: STAIRWAYS
Room 1-145-2-TS

fuel: paint
model: comparison with other compartments

alpha: 0.03

Q max: (Q *)/(lb m of fuel in the room)

Q *: 2.8 kW/lb m

t virt: 30 seconds
t peak: determined from alpha and Q max
t crit: 15 seconds

COMPARTMENT TYPE: PASSAGEWAYS
Room 2-271-5-LP

fuel: paint, rubbish
model: comparison with other compartments

alpha: 0.01 kW/s)

Q max: (Q *)/(lb m of fuel in the room)

Q *: 2.0 kW/lb m

t virt: 45 seconds
t peak: determined from alpha and Q max
t crit: 30 seconds

COMPARTMENT TYPE: BERTHING

fuel: mattresses, wardrobe, hanging and floor piled clothes

model: Factory Mutual's OAOR2.BU-2..OAOR2.BU-7, this was a full-scale and fully furnished bedroom test
NBSIR 82-246, this was a fully furnished jail cell test.

alpha: 0.048 kW/s}
4 < [fuel loading (psf)], and a normal sized door vent.

0.028 kW/s}
fuel loading (psf) < 4 with normal sized door vent

0.015 kW/s}
for a vent less than 2 feet wide or ventilation is restricted in any manner

Q max: (Q *)/(lb m of fuel in the room)

Q *: 3.75 kW/lbm
4 < fuel loading (psf) and normal sized door vent.

2.9 kW/lbm
fuel loading (psf) < 4 with normal sized door vent

1.2 kW/lbm
for a vent less than 2 feet wide or ventalation is restricted in any manner

Q * and ' were determined from judgement based upon the above experimental results. Appendix C (Figures 3,4a and 4b) contains the appropriate worksheets

t virt: 75 seconds
t peak: obtained from '
t crit: 25 seconds, 240 seconds if ventilation limiting

COMPARTMENT TYPE: STORAGE of STACKED PAPER/LIGNOCELLULOSICS

fuel: tightly packed cartons of paper/cellulosics/lignin stacked to 10 feet high.

model: NFPA 72-E. item 10. This model was extrapolated from a comparison with the wooden pallet model above.

alpha: 0.001715 kW/s}+(H-5ft)y0.000306 kW/s}yft

where the applicable range is {5-15ft}. alpha is a variable function in the height of the stack.

Q max: 100 kW/ft}+(H-5ft)y18 kW/ft}yft

Q max is a variable function in the height of the stack where the applicable range is {5-15ft}.

The equation for alpha and Q max was determined with the consideration of ' and Q max of stacked wooden pallets. The assumptions was that the change in height affected the ' and Q max of both fuels the same. See appendix B for the sample calculations.

Q *: unapplicable since Q max varies with height

t virt: 150 seconds
t peak: 1700 seconds (obtained from ')
t crit: 300 seconds (judgment)

COMPARTMENT TYPE: STORAGE of STACKED WOODEN PALLETS

fuel: stacked wooden pallets to 13 feet.
model: NFPA 72-E, items 1,2,3 & 4.

alpha: 0.02 kW/s} + (H-1.5ft)y0.00951kW/s}yft

where the applicable range is {1.5-15ft}. alpha is a variable function in the height of the stack. See appendix a, Figure 1 for the sample calculations

Q max: 116.1kW/ft}+(H-1.5ft)y56.07kW/ft}yft

where the applicable range is {1.5-16ft}. Q max is a variable function in the height of the stack and the floor area of the fuel. See appendix a for the sample calculations.

Note: it was assumed that 75% of the floor area would be occupied by fuel.

Q *: unapplicable since Q max varies with height

t virt: 45 seconds
t peak: 91 seconds (obtained from ')
t crit: 30 seconds (judgment; fast growing fires have short t criticals)

COMPARTMENT TYPE: STORAGE of STACKED PLASTICS (PS) IN CARTONS

fuel: gear locker, assumed to be all plastics.

model: alpha was determined from NFPA 72-E appendix a, item # 15 (PE bottles). Q max was guessed due to the multitude of different values for polyethylene.

alpha: 0.0772 kW/s}+(H-5ft)y0.01378 kW/s}yft

where the applicable range is {5-15ft}. is a variable function in the height of the stack

Q max: 122.2 kW/ft}+(H-5ft)y21.95 kW/ft}

where the applicable range is {5-15ft}. is a variable function .n the height of the stack

The ` and Q max were determined with the same methodology as the stacked paper/lignocellulosics compartment type.

Q *: inapplicable due to the dependence of Q max fuel height and floor area.

t virt: 120 seconds
t peak: 195 seconds (obtained from `)
t crit: 180 seconds (judgment)

COMPARTMENT TYPE: STORAGE of UNSTACKED CELLULOSICS AND PLASTICS

fuel: both cellulosic, lignose and polysynthetic plastics boxed in cartons

model: determined from NBSIR 80-2120 & judgment based on comparison with office, berthing, storage and lounge compartments

alpha: 0.1 6 < fuel loading (psf)

0.04 fuel loading (psf) < 6

0.006 ventilation limited

Q max: (Q *)/(lb m of fuel in the room)

Q *: 6.0 kW/lbm 6 < fuel loading (psf)

3.5 kW/lbm fuel loading (psf) < 6

1.2 kW/lbm ventilation limited

t virt: 20 seconds
t peak: obtained from
t crit: 90 seconds, 240 seconds for vent limitations

COMPARTMENT TYPE: STORAGE of BAGGED PAPER & LIGNOCELLULOSICS

fuel: seabag stowage

model: NFPA 72-E, item 5: mail bags stacked to 5 feet.

alpha: 0.02923 kW/s)

Q max: 36.93 kW/ft)

Q *: inapplicable since Q max is a function of floor area

t virt: 120 seconds
t peak: 195 seconds (obtained from)
t crit: 180 seconds (judgment)

COMPARTMENT TYPE: VERY LOW DENSITY (NOT STACKED) STORAGE

fuel: very low density storage or very noncombustible conditions. for example refrigeration, galleys...

model: judgment based on comparison with office, berthing, storage and lounge compartments

alpha: 0.0005 kW/s²

Q max: (Q *)/(lb m of fuel in the compartment)

Q *: 0.5 kW/lbm

t virt: 240 seconds
t peak: obtained from
t crit: 360 seconds

COMPARTMENT TYPE: OFFICE

fuel: paper, paper files, bookcases, sofas, desk, ottoman, chair, carpet (optional items below)

model: NBSIR 80 2120, report by Fang on heavily loaded basement fires. Full room experiments.

alpha: : 0.7 6 < fuel loading (psf)
rooms with combustible wall linings or rooms without combustible wall linings but excessive amounts of loose paper

': 0.3 3 < fuel loading (psf) < 6
rooms with combustible wall linings but not as much 'loose' paper or without combustible wall linings and predominantly easily ignitable fuel.

': 0.15 fuel loading (psf) < 6
no combustible wall linings, sparce fuel loading or limited ventilation

Q max: determined from Q *

Q *: 7.5 kW/lbm 6 < fuel loading (psf)

5.0 kW/lbm 3 < fuel loading (psf) < 6

3.0 kW/lbm fuel loading (psf) < 6
no combustible wall linings

1.2 kW/lbm ventilation limited

t virt: 40 seconds
t peak: obtained from '
t crit: 45 seconds, 240 seconds if ventilation limited

COMPARTMENT TYPE: LOUNGE

fuel: furniture to include paper files, bookcases, sofas, chairs, T.V.'s, desks, ottoman, chair, carpet

model: NBSIR 80 2120, report by Fang on heavily loaded basement fires. Full room experiments.

NBSIR 83-2787 and Wickstrom s sofa data (free burn)

previous compartment model for offices.
previous compartment model for berthing.

alpha: : 0.3 4 < fuel loading (psf)
rooms with combustible wall linings predominantly easily ignitable fuel. shelving/bookcases with loose papers

: 0.185 fuel loading (psf) < 4
no combustible wall linings, sparce fuel loading

: 0.006 fuel loading (psf) < 4
natural (cotton or wool) fabric covering over the furniture. no combustible wall linings or bookcases/shelves or limited ventilation

alpha was determined from NBSIR 80-2120

Q max: (Q *)/(lb m of fuel in the room)

Q *: Q *: 5.0 kW/lbm 4 < fuel loading (psf)

Q *: 2.25 kW/lbm fuel loading (psf) : 4

Q *: 1.2 kW/lbm ventilation limited

determined from comparing with NBSIR 80-2120 and judgment

t'virt: 40 seconds
t peak: obtained from
t crit: 45 seconds, 240 seconds for vent limited

How the base set was extrapolated to the remaining rooms

alpha: this number or formula remains constant for any compartment within the same subset. i.e. the alphas for all the passageway compartments are the same. Exception: rooms with stacked storage.

Q max: this was scaled in two different ways. The first method preserved Q * between compartments. Q * is the heat release per pound mass of fuel in the room. The other method determined Q max from a linear relationship in the height of a stacked fuel.

Q *: this number remains constant for all rooms of a compartments type.

t virt: ignored for this work. but remains constant for all members in a subgroup

t peak: calculated from alpha and Q max.

t crit: this number remains constant for all members in a compartment type.

Enhancement projects

These are notes and ideas that arose from this project:

Of the three fire growth parameters, the fire growth rate (α), appears the most important. Alpha is a function of the type of fuel, the amount of fuel, the density of the fuel, the geometry of the fuel, the room ventilation and the compartment's thermal inertia. Alpha also appears to exhibit the most relative influence over the other variables. From this insight, it appears possible to predict what the other two variables (Q max and t crit) will be--given alpha and the fuel loading density.

Future work might be useful in determining...

how stack height affects: alpha,heat release, t crit.

a normalized heat load from alpha, fuel density and fuel type data. I know T.Z. Harmathy has done some work in this area, but we are avoiding wall linings.

predicting t critical from alpha, Q max, fuel density and type. This parameter was difficult to access in particular for pool fires and the grease fires of the machinery rooms. If one assumes that t crit equals the amount of time to burn

all the remaining fuel after Q max is reached. the predicted values are on the order of hundreds of hours. This implies that the heat release rate is not high enough in these type of fires. Maybe I should take the dirt out of the greasy, sooty environment fires considerations. I dunno.

determining the size of a pool fire diameter given a leakage rate. I assumed a constant liquid thickness, but this parameter is an extremely sensitive factor in determining alpha and Q max.

Develope a spray fire algorithm.

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APPENDIX H

Pre-Flashover and FRI Times for the PIR

Appendix H is an alphabetical listing of compartments by Use Indicator ordered by Compartment ID within each Indicator. Parameters listed include those used to calculate Full Room Involvement Time and the FRI time which was assigned.

Glossary

tcrit - the duration of burning at Qmax

Qmax - the maximum heat release rate for a compartment

alpha - the linear coefficient for the fire growth curve

FRI|EB - The time when the compartment as room of origin reaches Full Room Involvement or Flashover measured from the time it reached Established Burning.

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PRE-FLASHOVER DATA & FRI TIME
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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Compt ID	t crit (sec)	Q max (kw)	alpha (kw/sqsec)	Area (sqft)	Total Fuel (BTU/sqft)	FRI/EB (min)
Use ID: AA						
2-49-0-AA	180	275,743	0.132	3007	598	13
3-311-0-AA	180	188,709	0.118	2058	777	12
3-49-0-AA	180	141,983	0.146	1548	1,291	11
Use ID: AG						
01-162-5-A	45	44,963	0.818	163	732	3
01-218-3-A	180	4,004	0.151	42	25,471	3
01-218-4-A	180	3,527	0.151	37	29,032	3
01-255-8-A	90	7,000	0.100	25	312	3
02-158-2-A	180	2,318	0.151	24	45,000	3
03-157-2-A	180	2,593	0.151	27	40,000	3
03-162-1-A	180	2,043	0.151	21	51,428	3
04-126-4-A	180	2,134	0.132	26	40,754	3
1-207-3-A	90	4,860	0.100	54	2,222	3
1-207-5-A	90	6,750	0.100	75	1,600	5
1-210-3-A	180	943	0.151	9	120,000	3
1-217-2-A	90	1,344	0.100	22	3,571	3
1-218-2-A	90	2,208	0.100	36	2,173	3
1-223-4-A	90	5,760	0.100	64	1,875	3
1-233-2-A	180	4,574	0.187	48	43,333	3
1-307-2-A	45	45,333	0.818	220	544	3
2-100-3-A	180	2,134	0.151	22	49,090	3
2-100-5-A	180	1,833	0.077	20	800	4
2-148-1-A	90	140	0.040	20	800	3
2-157-2-A	180	1,878	0.151	19	56,250	3
2-343-2-A	90	27,224	0.100	302	396	8
2-49-1-A	480	4,655	0.029	168	475	5
Use ID: AR						
1-255-1-A	360	24,000	0.000	320	3,750	999
1-49-3-A	360	32,195	0.000	429	2,795	999
1-61-1-A	360	8,442	0.000	112	10,657	999
1-61-3-A	360	21,600	0.000	288	4,166	999
1-81-1-A	360	31,783	0.000	423	2,831	999
Use ID: AS						
01-153-1-A	180	4,673	0.146	49	32,128	3
01-218-8-A	180	15,726	0.146	170	9,389	4
01-255-10-A	180	5,975	0.146	64	25,000	4
02-145-1-A	180	8,886	0.132	96	15,000	4
02-162-2-A	180	8,886	0.132	96	15,000	4
03-132-2-A	500	29,643	0.008	651	42	6
03-147-1-A	90	168	0.010	70	56	4
03-157-1-A	180	2,562	0.132	27	53,333	3
1-154-1-A	180	4,574	0.187	48	43,333	3
1-162-6-A	180	8,514	0.187	91	22,857	4
1-207-1-A	90	1,296	0.100	56	571	4
1-4-0-A	180	56,192	0.187	611	3,403	6
1-49-4-A	180	64,489	0.187	701	2,964	6

1-64-2-A	180	66,621	0.187	725	2,868	6
1-89-4-A	30	10,030	0.096	110	18,909	10
2-154-1-A	300	3,582	0.002	46	30,769	3
2-195-1-A	180	23,183	0.132	252	5,714	5
2-22-0-A	300	95,659	0.002	1274	1,129	8
2-343-0-A	300	64,006	0.002	852	1,501	8
2-388-1-A	300	21,661	0.002	288	4,442	5
2-388-2-A	300	21,661	0.002	228	5,611	5
2-4-0-A	300	37,176	0.002	494	2,910	6
2-65-1-Q	90	52,787	0.100	586	204	6
3-22-0-A	300	55,637	0.003	740	2,160	6
3-4-0-A	300	6,652	0.003	87	18,285	4
Use ID: C						
01-319-0-C	1800	9,313	0.008	716	11	8
04-108-0-C	1800	33,278	0.008	1706	7	12
1-223-0-C	3600	194,560	0.180	608	52	6
2-223-0-C	3600	199,431	0.180	1661	7	12
2-343-3-C	3600	142,966	0.180	446	71	6
2-55-2-C	3600	187,689	0.180	586	54	6
Use ID: E						
02-178-0-E	7200	9,659	0.055	1440	12	3
03-178-2-E	360	200	0.005	800	5	3
1-178-1-E	7200	2,268	0.013	703	12	3
1-178-2-E	7200	2,268	0.013	703	2	3
2-178-1-E	7200	2,268	0.013	700	12	3
2-178-2-E	7200	2,268	0.013	700	12	3
2-361-1-E	2700	71,908	0.408	704	60	7
2-361-2-E	2700	71,703	0.408	702	60	7
3-100-0-E	3600	77,744	0.441	3120	5	6
3-162-0-E	4000	77,744	0.441	3432	4	6
3-223-0-E	7200	19,386	0.110	2688	6	5
3-271-0-E	7200	9,659	0.055	3179	5	5
4-100-0-E	3600	77,744	0.441	3126	5	6
4-162-0-E	4000	77,744	0.441	3432	4	6
4-223-0-E	7200	19,386	0.110	2606	7	6
4-271-0-E	7200	9,659	0.055	1615	11	3
4-49-0-E	7200	9,656	0.055	1535	11	4
5-100-0-E	3000	77,744	0.441	2391	7	6
5-162-0-E	3600	77,744	0.441	2575	7	6
5-223-0-E	5000	19,386	0.110	2013	9	6
5-49-0-E	3600	9,659	0.055	513	43	6
5-76-0-E	3000	9,659	0.055	696	29	6
Use ID: F						
3-100-1-F	0	0	0.000	472	0	-1
3-100-2-F	0	0	0.000	472	0	-1
3-127-1-F	0	0	0.000	318	0	-1
3-127-2-F	0	0	0.000	318	0	-1
3-145-2-F	0	0	0.000	237	0	-1
3-162-1-F	0	0	0.000	243	0	-1
3-178-1-F	0	0	0.000	322	0	-1
3-178-2-F	0	0	0.000	322	0	-1
3-199-1-F	0	0	0.000	354	0	-1
3-199-2-F	0	0	0.000	354	0	-1
3-223-1-F	0	0	0.000	358	0	-1
3-223-2-F	0	0	0.000	358	0	-1

3-247-1-F	0	0	0.000	329	0	-1
3-247-2-F	0	0	0.000	329	0	-1
4-100-1-F	0	0	0.000	714	0	-1
4-100-2-F	0	0	0.000	714	0	-1
4-162-1-F	0	0	0.000	674	0	-1
4-162-2-F	0	0	0.000	674	0	-1
4-223-1-F	0	0	0.000	491	0	-1
4-223-2-F	0	0	0.000	491	0	-1
4-271-1-F	0	0	0.000	180	0	-1
4-271-2-F	0	0	0.000	180	0	-1
4-49-1-F	0	0	0.000	198	0	-1
4-49-2-F	0	0	0.000	198	0	-1
4-76-1-F	0	0	0.000	395	0	-1
4-76-2-F	0	0	0.000	395	0	-1
5-100-1-F	0	0	0.000	829	0	-1
5-100-2-F	0	0	0.000	829	0	-1
5-162-1-F	0	0	0.000	812	0	-1
5-162-2-F	0	0	0.000	812	0	-1
5-223-1-F	0	0	0.000	541	0	-1
5-223-2-F	0	0	0.000	541	0	-1
5-271-0-F	0	0	0.000	1528	0	-1
5-76-1-F	0	0	0.000	363	0	-1
5-76-2-F	0	0	0.000	363	0	-1
Use ID: J						
4-271-3-J	0	0	0.000	295	0	-1
4-271-4-J	0	0	0.000	295	0	-1
4-299-1-J	0	0	0.000	43	0	-1
4-299-2-J	0	0	0.000	43	0	-1
4-303-1-J	0	0	0.000	81	0	-1
4-303-2-J	0	0	0.000	81	0	-1
Use ID: K						
1-028-0-K	1900	2,268	0.013	576	17	2
1-344-0-K	1800	466	0.013	48	472	2
Use ID: L						
01-146-3-L	25	1,289	0.028	177	112	5
02-100-2-L	25	2,775	0.028	382	52	5
1-174-1-L	90	6,212	0.100	414	48	7
1-199-1-L	90	33,150	0.100	110	3,619	4
1-213-3-L	90	315	0.100	21	952	-1
1-223-6-L	90	240	0.100	16	1,250	-1
Use ID: L1						
01-225-0-L	25	397	0.028	116	106	5
02-100-4-L	25	577	0.028	375	11	5
02-100-5-L	25	517	0.028	424	7	5
02-120-2-L	25	645	0.028	288	21	5
02-120-6-L	25	612	0.028	340	14	5
02-122-3-L	25	591	0.028	304	17	5
02-136-3-L	25	596	0.028	209	37	5
02-136-4-L	25	602	0.028	233	30	5
02-146-1-L	25	585	0.028	249	26	5
04-132-2-L	25	894	0.028	129	147	5
Use ID: L10						
2-100-2-L	25	6,005	0.048	375	91	4

2-100-4-L	25	6,006	0.048	402	79	4
2-121-3-L	25	6,005	0.048	319	125	4
2-121-4-L	25	6,004	0.048	358	99	4
2-271-2-L	25	5,995	0.048	245	212	4
2-271-5-L	25	5,996	0.048	381	87	4
2-271-6-L	25	6,065	0.048	310	134	4
Use ID: L2						
01-100-3-L	25	1,225	0.028	257	50	5
01-100-4-L	25	2,859	0.048	186	176	3
01-113-2-L	25	2,490	0.048	162	202	3
01-118-3-L	25	1,177	0.028	202	78	5
01-125-4-L	25	2,583	0.048	166	195	3
01-132-3-L	25	686	0.028	143	92	5
01-162-6-L	25	2,286	0.048	148	220	3
01-222-1-L	25	1,324	0.028	184	107	5
01-222-2-L	25	943	0.028	131	151	5
01-239-3-L	25	1,129	0.028	165	114	5
01-239-4-L	25	1,392	0.028	165	114	5
01-255-0-L	25	1,056	0.028	137	169	5
01-255-2-L	25	1,172	0.028	150	140	5
01-255-3-L	25	753	0.028	149	143	5
01-271-1-L	25	1,719	0.028	229	60	5
01-271-4-L	25	1,142	0.028	152	135	5
01-271-8-L	25	1,361	0.028	204	90	5
01-277-5-L	25	1,159	0.028	192	86	5
01-292-4-L	25	911	0.028	148	113	5
01-292-8-L	25	1,227	0.028	180	104	5
01-311-6-L	25	1,052	0.028	135	158	5
02-148-2-L	25	1,157	0.028	209	72	5
02-162-3-L	25	1,037	0.028	273	38	5
02-162-6-L	25	877	0.028	280	30	5
1-162-7-L	25	1,500	0.048	90	387	4
1-174-3-L	25	1,500	0.048	85	443	4
Use ID: L4						
01-142-2-L	25	1,935	0.048	224	81	3
2-291-3-L	25	2,399	0.048	206	120	3
Use ID: L6						
2-271-1-L	25	3,601	0.048	245	127	4
2-291-4-L	25	3,599	0.048	206	180	4
2-295-2-L	25	3,601	0.048	289	91	4
2-295-3-L	25	3,601	0.048	289	91	4
Use ID: L8						
2-100-1-L	25	4,796	0.048	269	141	4
Use ID: LL						
01-100-0-LL	45	8,247	0.185	1182	20	10
02-100-1-LL	45	3,186	0.185	456	54	5
1-100-5-LL	360	310	0.000	1240	3	15
1-124-2-LL	45	5,332	0.185	764	32	10
2-100-7-LL	45	3,811	0.185	546	45	15
2-134-1-LL	45	1,708	0.185	244	101	5
Use ID: LP						
01-100-2-LP	30	356	0.010	446	7	20

01-114-1-LP	30	301	0.010	377	8	20
01-162-2-LP	30	157	0.010	196	16	20
01-162-3-LP	30	115	0.010	144	22	20
01-178-1-LP	30	179	0.010	224	14	20
01-218-5-LP	30	351	0.010	439	7	20
01-218-6-LP	30	110	0.010	138	23	20
01-239-6-LP	30	102	0.010	128	25	20
01-255-6-LP	30	168	0.010	210	15	20
01-292-2-LP	30	140	0.010	175	18	20
02-115-1-LP	30	271	0.010	339	9	20
02-121-2-LP	30	253	0.010	317	10	20
02-178-1-LP	30	126	0.010	160	20	20
03-111-2-LP	30	267	0.010	334	9	20
03-140-1-LP	30	309	0.010	386	8	20
1-100-0-LP	30	214	0.010	268	11	20
1-100-2-LP	30	196	0.010	245	0	20
1-100-3-LP	30	196	0.010	245	13	20
1-162-2-LP	30	207	0.010	259	12	20
1-162-3-LP	30	324	0.010	405	7	20
1-207-2-LP	30	148	0.010	185	17	20
1-223-2-LP	30	307	0.010	384	8	20
1-239-1-LP	30	30	0.010	38	83	20
1-319-0-LP	30	278	0.010	347	9	20
1-49-1-LP	30	349	0.010	437	7	20
1-49-2-LP	30	426	0.010	533	6	20
1-52-0-LP	30	403	0.010	504	6	20
2-100-0-LP	30	775	0.010	969	3	20
2-162-2-LP	30	318	0.010	397	8	20
2-162-3-LP	30	268	0.010	335	9	20
2-223-1-LP	30	164	0.010	206	15	20
2-223-2-LP	30	153	0.010	192	16	20
2-271-3-LP	30	213	0.010	267	11	20
2-271-4-LP	30	211	0.010	264	12	20

Use ID: LW

01-106-2-LW	30	48	0.010	48	83	999
01-111-1-LW	30	66	0.010	66	60	999
01-117-2-LW	30	54	0.010	54	74	999
01-118-[illegible]-LW	30	40	0.010	40	100	999
01-123-2-LW	30	48	0.010	48	83	999
01-132-1-LW	30	33	0.010	33	121	999
01-140-1-LW	30	46	0.010	46	0	999
01-154-2-LW	30	46	0.010	45	87	999
01-162-4-LW	30	38	0.010	38	103	999
01-218-1-LW	30	42	0.010	42	94	999
01-218-2-LW	30	47	0.010	47	84	999
01-222-0-LW	30	27	0.010	27	148	999
01-239-1-LW	30	27	0.010	27	148	999
01-239-2-LW	30	27	0.010	27	148	999
01-255-1-LW	30	22	0.010	22	177	999
01-255-4-LW	30	25	0.010	25	158	999
01-255-5-LW	30	26	0.010	26	149	999
01-271-6-LW	30	33	0.010	38	103	999
01-277-1-LW	30	25	0.010	25	160	999
01-277-3-LW	30	24	0.010	25	160	999
01-278-2-LW	30	39	0.010	39	102	999
01-292-6-LW	30	34	0.010	34	116	999
01-298-2-LW	30	41	0.[illegible]	41	96	999

01-311-4-LW	30	38	0.010	38	105	999
02-113-2-LW	30	63	0.010	63	63	999
02-116-1-LW	30	48	0.010	48	83	999
02-120-4-LW	30	63	0.010	63	63	999
02-122-1-LW	30	58	0.010	58	68	999
02-132-2-LW	30	58	0.010	58	68	999
02-136-1-LW	30	42	0.010	42	94	999
02-136-2-LW	30	42	0.010	42	94	999
02-152-2-LW	30	72	0.010	72	55	999
02-154-1-LW	30	51	0.010	51	78	999
02-162-4-LW	30	59	0.010	59	67	999
02-171-1-LW	30	63	0.010	63	63	999
03-117-2-LW	30	33	0.010	33	121	999
04-126-2-LW	30	35	0.010	35	111	999
1-100-4-LW	0	0	0.010	26	0	999
1-162-5-LW	30	98	0.010	98	40	999
1-213-1-LW	0	0	0.010	28	0	999
1-302-2-LW	30	35	0.010	35	114	999
2-111-1-LW	30	80	0.010	80	49	999
2-111-2-LW	30	104	0.010	105	38	999
2-121-1-LW	30	105	0.010	105	38	999
2-121-2-LW	30	104	0.010	105	38	999
2-125-2-LW	30	100	0.010	100	40	999
2-281-1-LW	30	74	0.010	74	53	999
2-281-2-LW	30	74	0.010	74	53	999
2-284-1-LW	30	116	0.010	116	34	999
2-284-2-LW	30	121	0.010	121	32	999
2-291-1-LW	30	40	0.010	40	100	999
2-291-2-LW	30	40	0.010	40	100	999
2-295-1-LW	30	50	0.010	50	80	999
2-295-4-LW	30	50	0.010	50	80	999
Use ID: M						
1-210-0-M	*****	1,000,000	5.000	157	20,330	3
2-61-1-M	*****	1,000,000	5.000	133	23,934	3
Use ID: Q						
01-126-1-Q	360	65	0.005	259	15	6
01-311-2-Q	360	16	0.005	64	61	3
02-129-1-Q	360	59	0.005	236	16	6
02-228-0-Q	0	0	0.000	2108	0	-1
03-105-0-Q	300	34,138	0.008	1313	12	8
03-105-1-A	500	227,526	0.008	1165	103	10
03-106-2-A	180	61,951	0.132	675	2,133	6
03-134-1-Q	300	1,726	0.008	66	240	4
03-228-0-Q	0	0	0.000	2038	0	-1
1-105-0-Q	360	296	0.005	1185	3	6
1-119-[illegible]-Q	360	46	0.005	182	21	999
1-132-[illegible]-Q	90	446	0.040	255	20	3
1-162-4-Q	90	2,870	0.040	205	156	3
1-199-3-L	90	700	0.100	46	420	4
1-22-0-Q	3600	193,116	0.180	1609	7	999
1-239-2-A	45	26,352	0.818	128	937	5
1-245-1-Q	2800	9,796	0.180	81	147	999
1-255-0-Q	300	13,104	0.008	280	97	6
1-271-2-Q	90	3,679	0.040	525	30	4
1-326-0-Q	0	0	0.000	144	0	-1
1-4-2-Q	300	4,394	0.008	169	94	6

1-49-5-Q	3600	38,376	0.180	319	37	999
2-148-3-Q	90	1,512	0.040	216	74	5
2-162-4-Q	3600	72,792	0.180	606	19	10
2-162-5-Q	180	8,824	0.029	318	50	3
2-180-1-Q	180	7,976	0.029	298	55	3
2-195-2-Q	90	6,857	0.040	489	65	6
2-205-1-Q	300	10,982	0.008	241	115	8
2-210-0-Q	300	2,184	0.008	112	107	10
2-223-3-Q	300	36,577	0.008	803	34	8
2-223-4-Q	300	36,577	0.008	803	34	8
2-251-2-A	45	2,401	0.818	35	1,142	1
2-252-1-Q	300	4,724	0.008	242	49	11
2-311-0-Q	300	50,406	0.008	2584	4	999
2-95-2-Q	1800	750	0.008	38	311	5
3-331-1-Q	0	0	0.000	192	0	-1
Use ID: QF						
01-239-8-A	180	11,840	0.146	128	12,500	999
03-162-2-Q	360	122	0.005	489	8	999
03-162-3-Q	360	76	0.005	304	13	999
1-49-0-Q	360	59	0.005	236	16	999
2-252-2-QF	360	47	0.005	188	21	999
Use ID: QC						
01-271-2-Q	45	4,878	0.150	650	30	5
02-218-0-QO	45	3,300	0.150	440	45	5
03-218-0-Q	360	115	0.005	460	8	5
04-126-0-Q	45	8,521	0.300	681	29	5
1-100-6-Q	180	33,672	0.002	448	44	5
1-178-4-QO	45	1,242	0.150	165	120	5
1-178-6-QO	45	685	0.150	91	218	5
1-187-2-QO	45	1,575	0.300	126	158	5
1-198-2-QO	45	1,691	0.150	225	88	5
1-206-2-QO	45	1,575	0.300	126	158	5
1-210-1-Q	90	938	0.040	107	186	5
1-210-2-Q	180	1,772	0.029	64	312	5
1-89-2-QO	45	1,100	0.300	88	227	5
2-139-2-QO	45	3,375	0.300	270	74	5
2-146-2-Q	45	3,667	0.300	293	68	5
2-210-01-Q	45	3,060	0.150	408	49	5
Use ID: QS						
01-295-1-Q	0	0	0.000	528	7	999
01-312-2-Q	45	554	0.150	52	530	4
1-239-0-Q	15	8,930	0.618	488	65	6
1-271-0-Q	60	1,764	0.185	794	20	8
1-287-2-Q	60	1,015	0.185	451	35	6
1-298-1-Q	45	4,752	0.150	528	45	999
1-328-1-Q	0	0	0.000	160	0	-1
1-328-2-Q	0	0	0.000	160	0	-1
1-328-4-Q	0	0	0.000	160	0	-1
Use ID: T						
01-138-1-T	15	23	0.010	16	250	999
02-138-1-T	15	22	0.010	15	263	999
1-138-1-T	15	22	0.010	15	263	999
1-145-1-T	240	5,760	0.180	48	250	999
1-169-2-T	240	5,976	0.180	49	240	999

1-311-2-T	15	86	0.010	60	65	999
2-145-1-T	240	5,760	0.180	48	250	999
2-169-2-T	240	5,976	0.180	49	240	999
2-311-2-T	15	95	0.010	67	59	999
3-311-2-T	15	95	0.010	67	59	999
Use ID: TS						
01-100-1-TS	15	99	0.010	87	36	999
01-145-2-TS	15	20	0.010	70	11	999
01-162-1-TS	15	27	0.010	96	8	999
01-261-2-TS	15	11	0.010	38	20	999
02-100-3-TS	15	20	0.010	71	11	999
02-145-2-TS	15	20	0.010	72	11	999
02-162-1-TS	15	27	0.010	96	8	999
03-129-1-TS	15	11	0.010	40	20	999
03-145-2-TS	15	27	0.010	70	11	999
03-165-1-TS	15	16	0 010	55	14	999
1-100-1-TS	15	25	0.010	87	9	999
1-145-2-TS	15	27	0.010	96	8	999
1-162-1-TS	15	22	0.010	76	10	999
1-213-2-TS	15	11	0.010	38	20	999
1-255-2-TS	15	36	0.010	128	6	999
1-278-2-TS	15	11	0.010	40	0	999
2-105-1-TS	15	11	0.010	38	21	999
2-145-2-TS	15	19	0.010	66	12	999
2-162-1-TS	15	32	0.010	112	7	999
2-210-2-TS	15	30	0.010	104	7	999
2-256-1-TS	15	16	0.010	56	14	999
2-256-2-TS	15	30	0.010	105	7	999
2-275-2-TS	15	30	0.010	104	7	999
2-279-1-TS	15	10	0.010	36	22	999
Use ID: TU						
01-145-0-TU	300	9	0.180	512	15	-1
01-162-0-TU	300	9	0.180	512	15	-1
02-145-0-TU	300	9	0.180	512	15	-1
02-162-0-TU	300	9	0.180	512	15	-1
03-145-0-TU	300	9	0.180	518	15	-1
03-162-0-TU	300	9	0.180	505	15	-1
04-145-0-TU	300	9	0.180	512	15	-1
04-162-0-TU	300	9	0.180	512	15	-1
1-145-0-TU	300	9	0.180	512	15	-1
1-162-0-TU	300	9	0.180	512	15	-1
2-145-0-TU	300	9	0.180	505	15	-1
2-162-0-TU	300	9	0.180	512	15	-1
Use ID: U						
1-49-7-U	0	0	0.000	172	0	-1
3-145-1-U	0	0	0.000	237	0	-1
3-162-2-U	0	0	0.000	243	0	-1
3-46-1-U	0	0	0.000	1010	0	-1
3-46-2-U	0	0	0.000	1010	0	-1
5-45-0-U	0	0	0.000	11	0	-1
Use ID: W						
01-178-0-W	0	0	0.000	1376	0	-1
01-178-2-W	0	0	0.000	560	0	-1
01-178-3-W	0	0	0.000	560	0	-1

02-178-2-W	0	0	0.000	720	0	-1
02-178-3-W	0	0	0.000	560	0	-1
2-014-0-W	0	0	0.000	189	0	-1
4-262-0-W	0	0	0.000	81	0	-1
4-31-0-W	0	0	0.000	198	0	-1
4-311-0-W	0	0	0.000	1518	0	-1

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APPENDIX I

Fire Detection Priorities and Recommendations for the PIR

Appendix I lists recommendations for detection in each compartment grouped and ordered by detection priority.

Glossary

Detection priority - a value derived in the following manner:

$$\text{Detection Priority} = \frac{\text{Frequency of EB} \times \text{\% of time compartment unoccupied}}{\text{Freq uloss} \times \text{Uloss}}$$

Frequency of EB - The expected frequency of established burning expressed as the ratio of number of fires anticipated per year. The data is based on historical records of fire casualties.

Uloss - A rating assigned to each compartment assessing the magnitude of the fire loss needed to cause loss of ship mission capabilities. Assigned values range from 1 (where a fire simply reaching Established Burning in the compartment would threaten mission performance) to 8 (where all compartments of one type lost to fire would be considered unacceptable.)

Frequency uloss - The threshold frequency of the unacceptable loss. It is expressed as the number of times the compartment can be lost per ship year.

Detection types - recommended type of detection include:

a. DRR - Rate of temperature rise detection system (RR)
b. DP - Photo electric smoke detection system (P)
c. DF - Flame detection system (UV or IR) (F)
d. DFT - Fixed temperature detection system (FT)
e. DI - Ionization smoke detection system (I)

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FIRE DETECTION PRIORITY AND RECOMMENDATIONS
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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Fire Detection Priorities of Compartments having assigned Detection Systems
Compartments grouped by their priority requirement
for automatic fire detection. (Range 0 to .3)
Each compartment is followed by the types of detection recommended for it.

plan_id / dect#	compart_name / description	height ft.	area sq.ft
Detection Priority = 0.282828			
3-100-0-E	ENGINE ROOM NO.1	10.0	3120.10
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
DF	Flame detection system (UV or IR) (F)		
3-162-0-E	ENGINE ROOM NO.2	10.0	3432.80
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
DF	Flame detection system (UV or IR) (F)		
4-100-0-E	ENGINE ROOM NO.1	10.0	3126.30
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
DF	Flame detection system (UV or IR) (F)		
4-162-0-E	ENGINE ROOM NO.2	10.0	3432.80
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
DF	Flame detection system (UV or IR) (F)		
5-100-0-E	ENGINE ROOM NO.1	8.0	2391.90
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
DF	Flame detection system (UV or IR) (F)		
5-162-0-E	ENGINE ROOM NO.2	8.0	2575.90
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
DF	Flame detection system (UV or IR) (F)		
Detection Priority = 0.075757			
4-271-0-E	PUMP ROOM	10.0	1615.90
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
DF	Flame detection system (UV or IR) (F)		
Detection Priority = 0.060606			
2-361-1-E	STEERING GEAR ROOM	9.0	704.80
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
DF	Flame detection system (UV or IR) (F)		
2-361-2-E	STEERING GEAR ROOM	9.0	702.80
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
DF	Flame detection system (UV or IR) (F)		

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  3-223-0-E        MOTOR GENERATOR ROOM                        10.0  2688.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

  4-223-0-E        MOTOR ROOM                                  10.0  2606.90
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

  5-223-0-E        MOTOR ROOM                                   8.0  2013.50
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

Detection Priority =  0.051300
  02-228-0-Q       HANGAR                                       9.0  2108.00
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

  03-228-0-Q       HANGAR                                       9.0  2088.00
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

Detection Priority =  0.037878
  1-178-1-E        BOILER ROOM UPPER LEVEL                     13.0   703.20
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

  2-178-1-E        BOILER ROOM                                  9.0   700.80
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

  2-178-2-E        BOILER ROOM                                  9.0   700.80
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

Detection Priority =  0.032000
  1-22-0-Q         ANCHOR WINDLASS MACHINERY ROOM              13.0  1609.30
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.030303
  1-028-0-K        FLAMMABLE LIQUIDS STOREROOM                 13.0   576.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.016969
  04-108-0-C       PILOT HOUSE                                  9.0  1706.60
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.016666
  2-311-0-Q        WINCH ROOM                                   9.0  2584.90
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)
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Detection Priority =  0.015151
  02-178-0-F        EMERGENCY/HARBOR GENERATOR ROOM          9.0  1440.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

  4-49-0-E          HYDRAULIC PUMP ROOM                     10.0  1535.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

Detection Priority =  0.013636
  2-223-3-Q         ELECTRICAL EQUIPMENT                     9.0   803.90
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-223-4-Q         ELECTRICAL EQUIPMENT ROOM NO.2           9.0   803.90
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.013333
  3-271-0-E         AUXILIARY MACHINERY ROOM                10.0  3179.80
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

Detection Priority =  0.012000
  1-105-0-Q         GALLEY                                  13.0  1185.50
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.000000
  1-178-2-E         BOILER ROOM UPPER LEVEL                 13.0   703.20
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

Detection Priority =  0.009595
  04-126-0-Q        METEROLOGY LAB & CHART ROOM              9.0   681.70
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.009500
  03-105-1-A        ELECTRONIC EQUIPMENT ROOM                9.0  1165.00
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.008000
  01-319-0-C        SCIENCE & WINCH CONTROL STATION         10.0   716.40
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.006666
  2-162-5-Q         SHIP LAUNDRY                             9.0   318.60
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
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Detection Priority =  0.006333
  2-180-1-Q        SELF-SERVICE LAUNDRY                        9.0   288.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.005940
  1-49-5-Q         REEFER MACHINERY ROOM                      13.0   319.80
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.005000
  1-132-1-Q        INCINERATOR ROOM                           13.0   255.40
   DP          Photo electric smoke detection system (P)

  2-262-1-Q        IC/GYRO ROOM                                9.0   242.30
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

  5-49-0-E         BOW THRUSTER MACHINERY ROOM                 8.0   513.70
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)
   DF          Flame detection system (UV or IR) (F)

  5-76-0-E         BOW THRUSTER MACHINERY ROOM                 8.0   696.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)
   DF          Flame detection system (UV or IR) (F)

Detection Priority =  0.004950
  1-245-1-Q        SCIENCE REEFER MACHY. ROOM                 13.0    81.60
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.004500
  1-119-1-Q        SCULLERY                                   13.0   182.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.004275
  01-100-0-LL      WARDROOM & LOUNGE                          10.0  1182.40
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-124-2-LL       CPO MESSROOM & LOUNGE                      13.0   764.50
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.004250
  03-106-2-A       ELECTRONIC SHOP                             9.0   675.00
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

  2-195-1-A        ELECTRICAL STOREROOM                        9.0   252.00
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)
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Detection Priority =  0.003750
  03-105-0-Q        RADIO ROOM                                  9.0  1313.00
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.003333
  01-295-1-Q        VESTIBULE                                  10.0   528.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  03-162-2-Q        FAN ROOM                                    9.0   489.80
   DP          Photo electric smoke detection system (P)

  03-162-3-Q        FAN ROOM                                    9.0   304.00
   DP          Photo electric smoke detection system (P)

  03-218-0-Q        AVIATION OFFICE                             9.0   460.00
   DP          Photo electric smoke detection system (P)

  1-207-1-A         STOREROOM                                  13.0    56.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-239-0-Q         DRY LAB                                    13.0   488.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-271-0-Q         WET LAB                                    13.0   784.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-287-2-Q         WET LAB NO.2                               13.0   451.20
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-295-1-Q         VESTIBULE                                  13.0   529.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-4-2-Q           BOW BOOM INSTRUMENT ROOM                   13.0   159.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  2-210-0-Q         GRAVIMETER ROOM                             9.0   112.00
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

  2-262-2-QF        FAN ROOM                                    9.0   188.70
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.003165
  1-64-2-A          DRY PROVISION STOREROOM                    13.0   725.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  2-210-01-Q        COMPUTER/NAV LAB                            9.0   408.00
   DP          Photo electric smoke detection system (P)
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  2-49-0-AA        SCIENCE STORAGE--UPPER CARGO HOLD          9.0  3007.70
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  3-311-0-AA       SCIENCE STORAGE--AFT CARGO HOLD           10.0  2058.30
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  3-49-0-AA        CARGO HOLD                                10.0  1548.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.002833
  2-195-2-Q        FIREFIGHTING EQPT ROOM                     9.0   489.80
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.002500
  1-255-0-Q        ELECTRONICS LAB                           13.0   288.00
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.002475
  02-100-1-LL      CO LOUNGE                                  9.0   456.80
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.002250
  2-100-7-LL       CREW LOUNGE                                9.0   546.40
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  2-134-1-LL       CREW STUDY                                 9.0   244.90
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.001727
  2-343-3-C        AFT REPAIR NO.2                            9.0   446.80
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  2-65-2-C         FORWARD REPAIR NO.3                        9.0   586.50
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.001571
  01-100-3-L       OFFICER SR                                10.0   257.50
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  01-100-4-L       CPO BERTHING                              10.0   186.00
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  01-113-2-L       CPO BERTHING                              10.0   162.00
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)
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01-118-3-L	OFFICER SR	10.0	203.00
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-125 4-L	CPO BERTHING	10.0	168.00
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-132-3-L	OFFICER SR	10.0	143.40
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-162-6-L	CPO BERTHING	10.0	148.70
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
[illegible] 1-L	SCIENTIST SR	10.0	184.10
	Ionization smoke detection system (I)		
	Photo electric smoke detection system (P)		
01-222-2-L	SCIENTIST SR	10.0	131.10
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-225-0-L	SCIENTIST SR	10.0	116.90
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-239-3-L	SCIENTIST SR	10.0	165.00
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-239-4-L	SCIENTIST SR	10.0	165.00
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-255-0-L	SCIENTIST SR	10.0	137.50
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-255-2-L	SCIENTIST SR	10.0	150 80
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-255-3-L	SCIENTIST SR	10.0	149.30
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-271-1-L	SCIENTIST SR	10.0	229.70
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-271-4-L	SCIENTIST SR	10.0	152.60
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-271-8-L	SCIENTIST SR	10.0	204.10
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		

01-277-5-L	SCIENTIST SR	10.0	192.20
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-292-4-L	SCIENTIST SR	10.0	148.80
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-292-8-L	SCIENTIST SR	10.0	180.10
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
01-311-6-L	SCIENTIST SR	10.0	135.30
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-100-4-L	CO SR	9.0	375.50
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-100-5-L	CHIEF SCIENTIST SR	9.0	424.50
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-120-2-L	OFFICER SR	9.0	288.90
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-120-6-L	VISITOR SR	9.0	340.20
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-122-3-L	OFFICER SR	9.0	304.00
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-136-3-L	OFFICER SR	9.0	209.80
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-136-4-L	OFFICER SR	9.0	233.20
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-146-1-L	OFFICER SR	9.0	249.20
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-148-2-L	OFFICER SR	9.0	209.90
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-162-3-L	OFFICER SR	9.0	273.00
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		
02-162-6-L	OFFICER SR	9.0	280.00
DI	Ionization smoke detection system (I)		
DP	Photo electric smoke detection system (P)		

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  04-132-2-L        SEA CABIN                                  9.0    129.50
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.001515
  1-271-2-Q         RECOMPRESSION AREA & DIVE GEAR LOCKER     13.0    525.60
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.001492
  01-142-2-L        CPO BERTHING                               10.0    224.40
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-100-1-L         CREW BERTHING                               9.0    269.30
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-100-2-L         CREW BERTHING                               9.0    375.00
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-100-4-L         CREW BERTHING                               9.0    402.40
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-121-3-L         CREW BERTHING                               9.0    319.60
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-121-4-L         CREW BERTHING                               9.0    358.20
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-271-1-L         CREW BERTHING                               9.0    245.60
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-271-2-L         CREW BERTHING                               9.0    245.60
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-271-5-L         CREW BERTHING                               9.0    381.70
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-271-6-L         CREW BERTHING                               9.0    310.50
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-291-3-L         CREW BERTHING                               9.0    206.40
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-291-4-L         CREW BERTHING                               9.0    206.40
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)
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  2-295-2-L        CREW BERTHING                                9.0   289.30
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

  2-295-3-L        CREW BERTHING                                9.0   289.30
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.001439
  02-218-0-QO      HELO EQUIP ROOM & OFFICE                     9.0   440.00
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.001428
  1-162-7-L        WARD NO.1                                   13.0    90.90
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-174-3-L        WARD NO.2                                   13.0    85.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.001250
  2-95-2-Q         FWD IC/GYRO ROOM                             9.0    38.50
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.001085
  1-100-5-LL       CREW MESS                                   13.0  1240.40
   DRR         Rate of temperature rise detection system (RR)
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.001055
  1-199-1-L        MEDICAL STORES                              13.0   110.50
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-199-3-L        X-RAY DARKROOM                              13.0    46.70
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.001021
  02-100-2-L       CO CABIN                                     9.0   382.80
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000722
  1-174-1-L        MEDICAL TREATMENT & EXAMINATION ROOM        13.0   414.20
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000720
  02-129-1-Q       PANTRY                                       9.0   236.80
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)
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Detection Priority = 0.000719

01-153-1-A	STOREROOM	10.0	49.80
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
01-218-8-A	SCIENCE BAGGAGE ROOM	10.0	170.40
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
01-239-8-A	FAN ROOM	10.0	128.00
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
01-255-10-A	STOREROOM	10.0	64.00
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
02-145-1-A	STOREROOM	9.0	96.00
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
03-157-1-A	STOREROOM	9.0	27.00
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
1-154-1-A	STOREROOM	13.0	48.00
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
1-233-2-A	BOAT GEAR LOCKER	13.0	48.00
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
1-4-0-A	STOREROOM	13.0	611.20
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
1-49-4-A	STOREROOM	13.0	701.70
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
2-154-1-A	STOREROOM	9.0	46.80
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
2-22-0-A	STOREROOM	9.0	1274.50
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
2-343-0-A	HAWSER STORES & SCIENCE CARGO	9.0	852.70
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		
2-388-1-A	STOREROOM	9.0	288.10
DRR	Rate of temperature rise detection system (RR)		
DP	Photo electric smoke detection system (P)		

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  2-388-2-A        STOREROOM                                  9.0   228.10
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  2-4-0-A          STOREROOM                                  9.0   494.70
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  3-22-0-A         STOREROOM                                 10.0   740.60
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  3-4-0-A          STOREROOM                                 10.0    87.50
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000643
  1-162-6-A        SHIP STORE STOREROOM                      13.0    91.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-89-4-A         SODA STORAGE 1000 CASES                   13.0   110.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000630
  01-126-1-Q       OFFICER PANTRY                            10.0   259.40
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000593
  1-145-1-T        MACHINERY HOIST ROOM                      13.0    48.00
   DP          Photo electric smoke detection system (P)

  1-169-2-T        MACHINERY HOIST ROOM                      13.0    49.80
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000568
  2-65-1-Q         ENGINEERING STOREROOM                      9.0   586.50
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000450
  1-223-0-C        AFT REPAIR NO.3 & DAMAGE CONTROL WORKSHO 13.0   608.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000437
  01-100-1-TS      STAIRCASE                                 10.0    87.00
   DP          Photo electric smoke detection system (P)

  01-114-1-LP      PASSAGE                                   10.0   377.40
   DP          Photo electric smoke detection system (P)

  01-162-2-LP      PASSAGE                                   10.0   196.80
   DP          Photo electric smoke detection system (P)
```

01-162-3-LP	PASSAGE	10.0	144.00
DP	Photo electric smoke detection system (P)		
01-178-1-LP	PASSAGE	10.0	224.00
DP	Photo electric smoke detection system (P)		
01-218-5-LP	PASSAGE	10.0	439.90
DP	Photo electric smoke detection system (P)		
01-218-6-LP	PASSAGE	10.0	138.10
DP	Photo electric smoke detection system (P)		
01-255-6-LP	PASSAGE	10.0	210.80
DP	Photo electric smoke detection system (P)		
01-292-2-LP	PASSAGE	10.0	175.60
DP	Photo electric smoke detection system (P)		
02-115-1-LP	PASSAGE	9.0	339.20
DP	Photo electric smoke detection system (P)		
02-121-2-LP	PASSAGE	9.0	317.20
DP	Photo electric smoke detection system (P)		
02-178-1-LP	PASSAGE	9.0	160.00
DP	Photo electric smoke detection system (P)		
03-111-2-LP	PASSAGE	9.0	334.60
DP	Photo electric smoke detection system (P)		
03-140-1-LP	PASSAGE	9.0	386.90
DP	Photo electric smoke detection system (P)		
1-100-0-LP	PASSAGE	13.0	268.10
DP	Photo electric smoke detection system (P)		
1-100-2-LP	PASSAGE	13.0	245.20
DP	Photo electric smoke detection system (P)		
1-100-3-LP	PASSAGE	13.0	245.20
DP	Photo electric smoke detection system (P)		
1-162-2-LP	PASSAGE	13.0	259.40
DP	Photo electric smoke detection system (P)		
1-162-3-LP	PASSAGE	13.0	405.00
DP	Photo electric smoke detection system (P)		
1-207-2-LP	PASSAGE	13.0	185.60
DP	Photo electric smoke detection system (P)		
1-223-2-LP	PASSAGE	13.0	384.00
DP	Photo electric smoke detection system (P)		
1-239-1-LP	PASSAGE	13.0	38.40
DP	Photo electric smoke detection system (P)		

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  1-319-0-LP        PASSAGE                                    13.0   347.60
   DP          Photo electric smoke detection system (P)

  1-49-1-LP         PASSAGE                                    13.0   437.20
   DP          Photo electric smoke detection system (P)

  1-49-2-LP         PASSAGE                                    13.0   533.00
   DP          Photo electric smoke detection system (P)

  1-52-0-LP         PASSAGE                                    13.0   504.00
   DP          Photo electric smoke detection system (P)

  2-100-0-LP        PASSAGE                                     9.0   969.40
   DP          Photo electric smoke detection system (P)

  2-162-2-LP        PASSAGE                                     9.0   397.80
   DP          Photo electric smoke detection system (P)

  2-162-3-LP        PASSAGE                                     9.0   335.60
   DP          Photo electric smoke detection system (P)

  2-223-1-LP        PASSAGE                                     9.0   206.00
   DP          Photo electric smoke detection system (P)

  2-223-2-LP        PASSAGE                                     9.0   192.00
   DP          Photo electric smoke detection system (P)

  2-271-3-LP        PASSAGE                                     9.0   267.20
   DP          Photo electric smoke detection system (P)

  2-271-4-LP        PASSAGE                                     9.0   264.80
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000378
  03-154-1-Q        HAM SHACK                                   9.0    66.40
   DI          Ionization smoke detection system (I)
   DP          Photo electric smoke detection system (P)

  1-49-0-Q          FAN ROOM                                   13.0   236.20
   DP          Photo electric smoke detection system (P)

Detection Priority =  0.000316
  01-162-5-A        ARCTIC GEAR LOCKER--OFFICER/CPO            10.0   163.80
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-207-5-A         BOAT GEAR LOCKER                           13.0    75.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-223-4-A         LIFE JACKET LOCKER                         13.0    64.00
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)

  1-307-2-A         ARCTIC GEAR LOCKER--SCIENTIST              13.0   220.20
   DRR         Rate of temperature rise detection system (RR)
   DP          Photo electric smoke detection system (P)
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Detection Priority =  0.000300
  01-312-2-Q        SCIENTIST COMM CENTER                    10.0    52.80
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.000250
  2-343-2-A         BOSN'S LOCKER                            9.0   302.49
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.000237
  03-157-2-A        GEAR LOCKER                              9.0    27.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  03-162-1-A        GEAR LOCKER                              9.0    21.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  1-239-2-A         PHOTO LAB                               13.0   128.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  2-100-3-A         GEAR LOCKER                              9.0    22.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  2-157-2-A         GEAR LOCKER                              9.0    19.20
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.000225
  03-132-2-A        ELECTRONIC STOREROOM                     9.0   651.50
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)

  2-162-4-Q         MACHINE SHOP                             9.0   606.60
   DI           Ionization smoke détection system (I)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.000130
  1-210-1-Q         BARBER SHOP                             13.0   107.20
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.000118
  01-146-3-L        OFFICER SR                              10.0   177.80
   DP           Photo electric smoke detection system (P)

  01-271-2-Q        SCIENTIST LIBRARY/CONFERENCE ROOM       10.0   650.40
   DP           Photo electric smoke detection system (P)

  1-100-6-Q         SHIP LIBRARY                            13.0   448.00
   DP           Photo electric smoke detection system (P)

  1-178-4-QO        SUPPLY OFFICE                           13.0   165.60
   DP           Photo electric smoke detection system (P)
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1-178-6-QO        SUPPLY OFFICER OFFICE                          13.0    91.40
 DP          Photo electric smoke detection system (P)

1-187-2-QO        1ST LT OFFICE                                  13.0   126.00
 DP          Photo electric smoke detection system (P)

1-198-2-QO        SHIP OFFICE                                    13.0   225.50
 DP          Photo electric smoke detection system (P)

1-206-2-QO        EXO OFFICE                                     13.0   126.00
 DP          Photo electric smoke detection system (P)

1-210-2-Q         MAIL ROOM                                      13.0    64.00
 DP          Photo electric smoke detection system (P)

1-217-2-A         C.G. LOCKER                                    13.0    22.40
 DRR         Rate of temperature rise detection system (RR)
 DP          Photo electric smoke detection system (P)

1-218-2-A         C.G. LOCKER                                    13.0    36.80
 DRR         Rate of temperature rise detection system (RR)
 DP          Photo electric smoke detection system (P)

1-89-2-QO         COMMISSARY OFFICE                              13.0    88.00
 DP          Photo electric smoke detection system (P)

2-100-5-A         STACK CHAIR LOCKER                              9.0    20.00
 DRR         Rate of temperature rise detection system (RR)
 DP          Photo electric smoke detection system (P)

2-130-2-QO        EXO OFFICE                                      9.0   270.00
 DP          Photo electric smoke detection system (P)

2-146-2-Q         ENGINEERING LOG & DAMAGE CONTROL CENTER         9.0   293.40
 DP          Photo electric smoke detection system (P)

2-148-1-Q         ATHLETIC GEAR LOCKER                            9.0    20.00
 DP          Photo electric smoke detection system (P)

2-148-3-Q         WEIGHT ROOM & GYM                               9.0   216.00
 DP          Photo electric smoke detection system (P)

Detection Priority =  0.000112
1-162-4-Q         SHIP STORE                                     13.0   205.10
 DRR         Rate of temperature rise detection system (RR)
 DP          Photo electric smoke detection system (P)

2-205-1-Q         ELECTRIC SHOP                                   9.0   241.40
 DI          Ionization smoke detection system (I)
 DP          Photo electric smoke detection system (P)

Detection Priority =  0.000059
02-138-1-T        DUMB WAITER                                     9.0    15.20
 DP          Photo electric smoke detection system (P)

1-311-2-T         ELEVATOR                                       13.0    60.80
 DP          Photo electric smoke detection system (P)
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```
Detection Priority =  0.000000
  1-210-0-M        SMALL ARMS STOW & REPAIR                    13.0   157.40
   DFT          Fixed temperature detection system (FT)
   DI           Ionization smoke detection system (I)
   DP           Photo electric smoke detection system (P)
   DF           Flame detection system (UV or IR) (F)

  1-328-2-Q        PORTABLE VAN                                13.0   160.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  1-328-4-Q        PORTABLE VAN                                13.0   160.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

  2-223-0-C        ENGINEERING CONTROL CENTER                   9.0  1661.90
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)

Detection Priority =  0.000000
  1-328-1-Q        PORTABLE VAN                                13.0   160.00
   DRR          Rate of temperature rise detection system (RR)
   DP           Photo electric smoke detection system (P)
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APPENDIX J

Assigned Fire Protection Systems on the PIR

Appendix J lists fire protection systems expected to be included for use by each compartment, ordered by Use Indicator and by Compartment ID within each Indicator.

Glossary

Protection Systems - types of protection expected include the following:

FIRST AID:

F1211	Hand portable Halon 1211 fire extinguisher
F1301	Hand portable Halon fire extinguisher (1301)
FCO2	Hand portable carbon dioxide fire extinguisher
FMON	Hand portable monoammonium phosphate fire extinguisher
FPKP	Hand portable dry chemical fire extinguisher (PKP)

AUTOMATIC:

A1301	Halon 1301 total flooding system - remotely actuated
AF	AFFF (3%) sprinkler system - remotely actuated
AFM	AFFF (3%) monitor - remotely controlled
APC	Aqueous potassium carbonate
AS	Seawater sprinkler system - remotely activated

MANUAL:

M100	1 1/2" Seawater hand line with "all purpose nozzle" 100 ft.
M50	1 1/2" Seawater hand line with "all purpose nozzle" 50 ft.
MF100	1 1/2" AFFF (3%) hand line with SFL variable nozzle 100 ft.
MF50	1 1/2" AFFF (3%) hand line with SFL variable nozzle 50 ft.
MHCO2	Carbon dioxide hand line
MHPKP	Dry chemical hand line

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ASSIGNED FIRE PROTECTION SYSTEMS
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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Compt ID	FF121	FF131	FCO2	FMON	FPKP	A130	AF1	AFM	APC	AS	M10	M50	MF10	MF50	MHCO2	MHPK
Use ID: AA																
2-49-0-AA	0	0	1	2	0	0	0	0	0	1	2	0	1	0	0	0
3-311-0-AA	0	0	1	1	0	0	0	0	0	1	2	0	0	0	0	0
3-49-0-AA	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0
Use ID: AG																
01-162-5-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-218-3-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-218-4-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-255-8-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-158-2-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-157-2-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-162-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
04-126-4-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-207-3-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-207-5-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-210-3-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-217-2-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-218-2-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-223-4-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-233-2-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-307-2-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2-100-3-A	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-100-5-A	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-148-1-Q	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-157-2-A	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-343-2-A	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-49-1-A	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Use ID: AR																
1-255-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-49-3-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-61-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-61-3-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-81-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Use ID: AS																
01-153-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-218-8-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-255-10-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-145-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-162-2-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-132-2-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-147-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-157-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-154-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-162-6-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-207-1-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

1-4-0-A	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
1-49-4-A	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-64-2-A	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-89-4-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2-154-1-A	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-195-1-A	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-22-0-A	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0
2-343-0-A	0	0	0	1	0	0	0	0	0	0	2	0	0	1	0	0
2-388-1-A	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-388-2-A	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-4-0-A	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-65-1-Q	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0
3-22-0-A	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0
3-4-0-A	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: C

01-319-0-C	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0
04-108-0-C	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-223-0-C	0	0	1	2	0	0	0	0	0	0	0	1	0	0	0	0
2-223-0-C	0	4	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-343-3-C	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-65-2-C	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: E

02-178-0-E	0	2	1	0	1	1	0	0	0	0	0	1	0	2	0	0
03-178-2-E	0	0	0	0	0	1	0	0	0	0	0	1	0	2	0	0
1-178-1-E	0	0	0	0	2	1	0	0	0	0	0	1	0	2	0	0
1-178-2-E	0	0	0	0	2	1	0	0	0	0	0	1	0	2	0	0
2-178-1-E	0	0	0	0	2	1	0	0	0	0	0	1	1	1	0	0
2-178-2-E	0	0	0	0	2	1	0	0	0	0	0	1	1	1	0	0
2-361-1-E	0	0	0	0	2	0	1	0	0	0	0	1	0	2	0	0
2-361-2-E	0	0	0	0	2	0	1	0	0	0	0	1	0	2	0	0
3-100-0-E	0	0	0	0	4	1	0	0	0	0	0	1	0	2	0	0
3-162-0-E	0	0	0	0	4	1	0	0	0	0	0	1	0	2	0	0
3-223-0-E	0	6	0	0	1	0	0	0	0	0	0	1	0	2	0	0
3-271-0-E	0	0	0	0	4	0	1	0	0	0	0	1	0	2	0	0
4-100-0-E	0	0	2	0	4	1	0	0	0	0	0	1	0	2	0	0
4-162-0-E	0	0	2	0	4	1	0	0	0	0	0	1	0	2	0	0
4-223-0-E	0	0	4	0	0	1	0	0	0	0	0	1	0	2	0	0
4-271-0-E	0	0	0	0	3	1	1	0	0	0	0	1	0	2	0	0
4-49-0-E	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0
5-100-0-E	0	0	2	0	4	1	1	0	0	0	0	1	0	2	0	0
5-162-0-E	0	0	2	0	4	1	1	0	0	0	0	1	0	2	0	0
5-223-0-E	0	0	0	0	0	1	0	0	0	0	0	1	0	2	0	0
5-49-0-E	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0
5-76-0-E	0	0	0	0	1	0	0	0	0	0	0	1	0	2	0	0

Use ID: F

3-100-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-100-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-127-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-127-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-145-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-162-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-178-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-178-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-199-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

3-199-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-223-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-223-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-247-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-247-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-100-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-100-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-162-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-162-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-223-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-223-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-271-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-271-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-49-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-49-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-76-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-76-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-100-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-100-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-162-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-162-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-223-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-223-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-271-0-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-76-1-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-76-2-F	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: J

4-271-3-J	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-271-4-J	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-299-1-J	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-299-2-J	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-303-1-J	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-303-2-J	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: K

1-028-0-K	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0
1-344-0-K	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Use ID: L

01-146-3-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
02-100-2-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-174-1-L	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0
1-199-1-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-213-3-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-223-6-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Use ID: L1

01-225-0-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-100-4-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
02-100-5-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
02-120-2-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-120-6-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
02-122-3-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
02-136-3-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-136-4-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

02-146-1-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
04-132-2-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Use ID: L10

2-100-2-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-100-4-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-121-3-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-121-4-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-271-2-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-271-5-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-271-6-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: L2

01-100-3-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
01-100-4-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
01-113-2-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
01-118-3-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
01-125-4-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
01-132-3-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
01-162-6-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
01-222-1-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
01-222-2-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-239-3-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-239-4-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-255-0-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-255-2-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-255-3-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-271-1-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-271-4-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-271-8-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-277-5-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-292-4-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-292-8-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
01-311-6-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-148-2-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-162-3-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
02-162-6-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-162-7-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-174-3-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Use ID: L4

01-142-2-L	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
2-291-3-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: L6

2-271-1-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-291-4-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-295-2-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-295-3-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: L8

2-100-1-L	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: LL

01-100-0-LL	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0
02-100-1-LL	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-100-5-LL	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-124-2-LL	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
2-100-7-LL	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-134-1-LL	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: LP

01-100-2-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-114-1-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-162-2-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-162-3-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-178-1-LP	0	0	1	0	1	0	0	0	0	0	0	1	0	1	0	0
01-218-5-LP	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0
01-292-2-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-115-1-LP	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
02-121-2-LP	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
02-178-1-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-111-2-LP	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-140-1-LP	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-100-0-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-100-2-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-100-3-LP	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
1-162-2-LP	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0
1-162-3-LP	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0
1-207-2-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-223-2-LP	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-239-1-LP	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
1-319-0-LP	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-49-1-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-49-2-LP	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-52-0-LP	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2-100-0-LP	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0
2-162-2-LP	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0
2-162-3-LP	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0
2-223-1-LP	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-223-2-LP	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-271-3-LP	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0
2-271-4-LP	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0

Use ID: LW

01-106-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-111-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-117-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-118-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-125-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-132-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-146-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-154-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-162-4-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-218-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-218-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-222-0-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-239-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-239-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-255-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-255-4-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-255-5-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

01-271-6-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-277-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-277-3-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-278-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-292-6-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-298-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-311-4-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-113-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-116-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-120-4-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-122-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-132-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-136-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-136-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-152-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-154-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-162-4-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-171-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-117-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
04-126-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-100-4-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-162-5-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-213-1-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-302-2-LW	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2-111-1-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-111-2-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-121-1-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-121-2-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-125-2-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-281-1-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-281-2-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-284-1-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-284-2-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-291-1-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-291-2-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-295-1-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-295-4-LW	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: M

1-210-0-M	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2-61-1-M	0	0	0	0	0	0	0	0	0	1	2	0	0	1	0	0

Use ID: Q

01-126-1-Q	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
01-311-2-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-129-1-Q	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
02-228-0-Q	2	0	2	0	5	0	1	0	0	0	0	1	1	0	0	0
03-105-0-Q	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-105-1-A	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-106-2-A	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-154-1-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-228-0-Q	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
1-105-0-Q	0	0	3	0	0	0	0	0	2	0	0	1	0	0	0	0
1-119-1-Q	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
1-132-1-Q	0	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0
1-162-4-Q	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-199-3-L	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-22-0-Q	0	0	0	0	1	0	1	0	0	0	0	1	0	2	0	0

1-239-2-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-245-1-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0
1-255-0-Q	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-271-2-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-326-0-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-4-2-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-49-5-Q	0	0	1	0	0	0	0	0	0	0	0	1	0	2	0	0
2-148-3-Q	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-162-4-Q	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-162-5-Q	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-180-1-Q	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-195-2-Q	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-205-1-Q	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-210-0-Q	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-223-3-Q	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-223-4-Q	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-251-2-A	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-262-1-Q	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-311-0-Q	0	0	0	0	3	0	1	0	0	0	0	1	0	5	0	0
2-95-2-Q	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-331-1-Q	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: QF

01-239-8-A	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-162-2-Q	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
03-162-3-Q	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
1-49-0-Q	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
2-262-2-QF	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: QO

01-271-2-Q	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0
02-218-0-QO	0	0	0	1	2	0	0	0	0	0	0	1	1	0	0	0
03-218-0-Q	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0
04-126-0-Q	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-100-6-Q	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-178-4-QO	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-178-6-QO	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-187-2-QO	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-198-2-QO	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-206-2-QO	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-210-1-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-210-2-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-89-2-QO	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
2-130-2-QO	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-146-2-Q	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
2-210-01-Q	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: QS

01-295-1-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-312-2-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-239-0-Q	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-271-0-Q	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-287-2-Q	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-295-1-Q	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1-328-1-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-328-2-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-328-4-Q	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Use ID: T

01-138-1-T	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-138-1-T	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-138-1-T	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-145-1-T	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-169-2-T	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-311-2-T	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2-145-1-T	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-169-2-T	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-311-2-T	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-311-2-T	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: TS

01-100-1-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-145-2-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-162-1-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-261-2-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-100-3-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-145-2-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-162-1-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-129-1-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-145-2-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-165-1-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-100-1-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-145-2-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-162-1-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-213-2-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-255-2-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-278-2-TS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2-105-1-TS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-145-2-TS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-162-1-TS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-210-2-TS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-256-1-TS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-256-2-TS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-275-2-TS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-279-1-TS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: TU

01-145-0-TU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-162-0-TU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-145-0-TU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-162-0-TU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03-145-0-TU	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
03-162-0-TU	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
04-145-0-TU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
04-162-0-TU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-145-0-TU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1-162-0-TU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2-145-0-TU	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
2-162-0-TU	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Use ID: U

1-49-7-U	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
3-145-1-U	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

3-162-2-V		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-46-1-V		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
3-46-2-V		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5-45-0-V		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Use ID: W																	
01-178-0-W		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
01-178-2-W		0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
01-178-3-W		0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
02-178-2-W		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
02-178-3-W		0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
2-014-0-W		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-262-0-W		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-31-0-W		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4-311-0-W		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
TOTALS:	402	2	37	34	84	64	16	11	0	2	6	278	263	10	66	0	0

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APPENDIX K

Effectiveness of Active Fire Protection on the PIR

Appendix K is an alphabetical listing of compartments by Use Indicator ordered by Compartment ID within each Indicator. Factors printed for each compartment indicate effectiveness of Automated and Manual Fire Protection.

Glossary

A Values - A percentage representing the probability that the fire will be suppressed by automated systems when the compartment is:
a. the room of origin (AIEB).
b. a room ignited by a thermal failure (AITbar) ,
c. a room ignited by a durability failure (AIDbar)

M Values - A percentage representing the probability that the fire will be suppressed manually (by damage-control teams) when the compartment is:
a. the room of origin (MIEB).
b. a room ignited by a thermal failure (MITbar)
c. a room ignited by a durability failure (MIDbar)

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EFFECTIVENESS OF ACTIVE FIRE PROTECTION
for
POLAR ICEBREAKER REPLACEMENT
(drawings dated 05/12/1987)

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Comp. ID	A VALUES IEB	A VALUES IT	A VALUES ID	M VALUES IEB	M VALUES IT	M VALUES ID
Use ID: AA						
2-49-0-AA	70	50	10	40	60	0
3-311-0-AA	70	50	10	40	60	0
3-49-0-AA	70	50	10	40	60	0
Use ID: AG						
01-162-5-A	0	0	0	40	30	0
01-218-3-A	0	0	0	40	30	0
01-218-4-A	0	0	0	40	30	0
01-255-8-A	0	0	0	40	30	0
02-158-2-A	0	0	0	40	30	0
03-157-2-A	0	0	0	40	30	0
03-162-1-A	0	0	0	40	30	0
04-126-4-A	0	0	0	40	30	0
1-207-3-A	0	0	0	40	30	0
1-207-5-A	0	0	0	40	30	0
1-210-3-A	0	0	0	40	30	0
1-217-2-A	0	0	0	40	30	0
1-218-2-A	0	0	0	40	30	0
1-223-4-A	0	0	0	40	30	0
1-233-2-A	0	0	0	40	30	0
1-307-2-A	0	0	0	40	30	0
2-100-3-A	0	0	0	40	30	0
2-100-5-A	0	0	0	40	30	0
2-148-1-Q	0	0	0	40	30	0
2-157-2-A	0	0	0	40	30	0
2-343-2-A	0	0	0	40	30	0
2-49-1-A	0	0	0	40	30	0
Use ID: AR						
1-255-1-A	0	0	0	0	0	0
1-49-3-A	0	0	0	0	0	0
1-61-1-A	0	0	0	0	0	0
1-61-3-A	0	0	0	0	0	0
1-81-1-A	0	0	0	0	0	0
Use ID: AS						
01-153-1-A	0	0	0	30	20	0
01-218-8-A	0	0	0	30	20	0
01-255-10-A	0	0	0	30	20	0
02-145-1-A	0	0	0	30	20	0
02-162-2-A	0	0	0	30	20	0
03-132-2-A	0	0	0	50	40	0
03-147-1-A	0	0	0	30	20	0
03-157-1-A	0	0	0	30	20	0
1-154-1-A	0	0	0	30	20	0
1-162-6-A	0	0	0	30	20	0

1-207-1-A	0	0	0	30	20	0
[illegible]-4-0-A	0	0	0	50	40	0
1-49-4-A	0	0	0	50	40	0
1-64-2-A	0	0	0	50	40	0
1-89-4-A	0	0	0	30	20	0
2-154-1-A	0	0	0	30	20	0
2-195-1-A	0	0	0	30	20	0
2-22-0-A	70	50	10	40	60	0
2-343-0-A	0	0	0	30	20	0
2-388-1-A	0	0	0	30	20	0
2-388-2-A	0	0	0	30	20	0
2-4-0-A	0	0	0	50	40	0
2-65-1-Q	0	0	0	30	20	0
3-22-0-A	70	50	10	40	60	0
3-4-0-A	80	60	20	30	20	0

Use ID: C

01-319-0-C	0	0	0	70	60	0
04-108-0-C	0	0	0	90	70	0
1-223-0-C	0	0	0	80	70	0
2-223-0-C	90	0	0	95	70	0
2-343-3-C	0	0	0	80	70	0
2-65-2-C	0	0	0	80	70	0

Use ID: E

02-178-0-E	85	20	0	10	40	0
03-178-2-E	85	20	0	10	40	0
1-178-1-E	80	20	0	10	40	0
1-178-2-E	80	20	0	10	40	0
2-178-1-E	80	20	0	10	40	0
2-178-2-E	80	20	0	10	40	0
2-361-1-E	60	20	0	10	40	0
2-361-2-E	60	20	0	10	40	0
3-100-0-E	85	20	0	10	40	0
3-162-0-E	85	20	0	10	40	0
3-223-0-E	80	15	0	10	40	0
3-271-0-E	85	20	0	10	40	0
4-100-0-E	85	20	0	10	40	0
4-162-0-E	85	20	0	10	40	0
4-223-0-E	80	15	0	10	40	0
4-271-0-E	85	20	0	10	40	0
4-49-0-E	0	0	0	5	30	0
5-100-0-E	85	20	0	10	40	0
5-162-0-E	85	20	0	10	40	0
5-223-0-E	80	15	0	10	40	0
5-49-0-E	0	0	0	5	30	0
5-76-0-E	0	0	0	5	30	0

Use ID: F

3-100-1-F	0	0	0	0	0	0
3-100-2-F	0	0	0	0	0	0
3-127-1-F	0	0	0	0	0	0
3-127-2-F	0	0	0	0	0	0
3-145-2-F	0	0	0	0	0	0
3-162-1-F	0	0	0	0	0	0

3-178-1-F	0	0	0	0	0	0
3-178-2-F	0	0	0	0	0	0
3-199-1-F	0	0	0	0	0	0
3-199-2-F	0	0	0	0	0	0
3-223-1-F	0	0	0	0	0	0
3-223-2-F	0	0	0	0	0	0
3-247-1-F	0	0	0	0	0	0
3-247-2-F	0	0	0	0	0	0
4-100-1-F	0	0	0	0	0	0
4-100-2-F	0	0	0	0	0	0
4-162-1-F	0	0	0	0	0	0
4-162-2-F	0	0	0	0	0	0
4-223-1-F	0	0	0	0	0	0
4-223-2-F	0	0	0	0	0	0
4-271-1-F	0	0	0	0	0	0
4-271-2-F	0	0	0	0	0	0
4-49-1-F	0	0	0	0	0	0
4-49-2-F	0	0	0	0	0	0
4-76-1-F	0	0	0	0	0	0
4-76-2-F	0	0	0	0	0	0
5-100-1-F	0	0	0	0	0	0
5-100-2-F	0	0	0	0	0	0
5-162-1-F	0	0	0	0	0	0
5-162-2-F	0	0	0	0	0	0
5-223-1-F	0	0	0	0	0	0
5-223-2-F	0	0	0	0	0	0
5-271-0-F	0	0	0	0	0	0
5-76-1-F	0	0	0	0	0	0
5-76-2-F	0	0	0	0	0	0

Use ID: J

4-271-3-J	0	0	0	0	0	0
4-271-4-J	0	0	0	0	0	0
4-299-1-J	0	0	0	0	0	0
4-299-2-J	0	0	0	0	0	0
4-303-1-J	0	0	0	0	0	0
4-303-2-J	0	0	0	0	0	0

Use ID: K

1-028-0-K	85	25	0	10	40	0
1-344-0-K	0	0	0	10	40	0

Use ID: L

01-146-3-L	0	0	0	30	40	0
02-100-2-L	0	0	0	30	40	0
1-174-1-L	0	0	0	30	40	0
1-199-1-L	0	0	0	30	40	0
1-213-3-L	0	0	0	0	0	0
1-223-S-L	0	0	0	0	0	0

Use ID: L1

01-225-0-L	0	0	0	30	40	0
02-100-4-L	0	0	0	30	40	0
02-100-5-L	0	0	0	30	40	0

02-120-2-L	0	0	0	30	40	0
02-120-6-L	0	0	0	30	40	0
02-122-3-L	0	0	0	30	40	0
02-136-3-L	0	0	0	30	40	0
02-136-4-L	0	0	0	30	40	0
02-146-1-L	0	0	0	30	40	0
04-132-2-L	0	0	0	30	40	0

Use ID: L10

2-100-2-L	0	0	0	30	50	0
2-100-4-L	0	0	0	30	50	0
2-121-3-L	0	0	0	30	50	0
2-121-4-L	0	0	0	30	50	0
2-271-2-L	0	0	0	30	50	0
2-271-5-L	0	0	0	30	50	0
2-271-6-L	0	0	0	30	50	0

Use ID: L2

01-100-3-L	0	0	0	30	40	0
01-100-4-L	0	0	0	30	40	0
01-113-2-L	0	0	0	30	40	0
01-118-3-L	0	0	0	30	40	0
01-125-4-L	0	0	0	30	40	0
01-132-3-L	0	0	0	30	40	0
01-162-6-L	0	0	0	30	40	0
01-222-1-L	0	0	0	30	40	0
01-222-2-L	0	0	0	30	40	0
01-239-3-L	0	0	0	30	40	0
01-239-4-L	0	0	0	30	40	0
01-255-0-L	0	0	0	30	40	0
01-255-2-L	0	0	0	30	40	0
01-255-3-L	0	0	0	30	40	0
01-271-1-L	0	0	0	30	40	0
01-271-4-L	0	0	0	30	40	0
01-271-8-L	0	0	0	30	40	0
01-277-5-L	0	0	0	30	40	0
01-292-4-L	0	0	0	30	40	0
01-292-8-L	0	0	0	30	40	0
01-311-6-L	0	0	0	30	40	0
02-148-2-L	0	0	0	30	40	0
02-162-3-L	0	0	0	30	40	0
02-162-6-L	0	0	0	30	40	0
1-162-7-L	0	0	0	30	40	0
1-174-3-L	0	0	0	30	40	0

Use ID: L4

01-142-2-L	0	0	0	30	40	0
2-291-3-L	0	0	0	30	40	0

Use ID: L6

2-271-1-L	0	0	0	30	50	0
2-291-4-L	0	0	0	30	50	0
2-295-2-L	0	0	0	30	50	0
2-295-3-L	0	0	0	30	50	0

Use ID: L8						
2-100-1-L	0	0	0	30	50	0
Use ID: LL						
01-100-0-LL	0	0	0	30	40	0
02-100-1-LL	0	0	0	30	40	0
1-100-5-LL	0	0	0	30	40	0
1-124-2-LL	0	0	0	30	40	0
2-100-7-LL	0	0	0	30	40	0
2-134-1-LL	0	0	0	30	40	0
Use ID: LP						
01-100-2-LP	0	0	0	40	60	0
01-114-1-LP	0	0	0	40	60	0
01-162-2-LP	0	0	0	40	60	0
01-162-3-LP	0	0	0	40	60	0
01-178-1-LP	0	0	0	40	60	0
01-218-5-LP	0	0	0	40	60	0
01-218-6-LP	0	0	0	40	60	0
01-239-6-LP	0	0	0	40	60	0
01-255-6-LP	0	0	0	40	60	0
01-292-2-LP	0	0	0	40	60	0
02-115-1-LP	0	0	0	40	60	0
02-121-2-LP	0	0	0	40	60	0
02-178-1-LP	0	0	0	40	60	0
03-111-2-LP	0	0	0	40	60	0
03-140-1-LP	0	0	0	40	60	0
1-100-0-LP	0	0	0	40	60	0
1-100-2-LP	0	0	0	40	60	0
1-100-3-LP	0	0	0	40	60	0
1-162-2-LP	0	0	0	40	60	0
1-162-3-LP	0	0	0	40	60	0
1-207-2-LP	0	0	0	40	60	0
1-223-2-LP	0	0	0	40	60	0
1-239-1-LP	0	0	0	20	30	0
1-319-0-LP	0	0	0	40	60	0
1-49-1-LP	0	0	0	40	60	0
1-49-2-LP	0	0	0	40	60	0
1-52-0-LP	0	0	0	40	60	0
2-100-0-LP	0	0	0	40	60	0
2-162-2-LP	0	0	0	40	60	0
2-162-3-LP	0	0	0	40	60	0
2-223-1-LP	0	0	0	40	60	0
2-223-2-LP	0	0	0	40	60	0
2-271-3-LP	0	0	0	40	60	0
2-271-4-LP	0	0	0	40	60	0
Use ID: LW						
01-106-2-LW	0	0	0	30	40	0
01-111-1-LW	0	0	0	30	40	0
01-117-2-LW	0	0	0	30	40	0
01-118-1-LW	0	0	0	30	40	0
01-125-2-LW	0	0	0	30	40	0

01-132-1-LW	0	0	0	30	40	0
01-146-1-LW	0	0	0	30	40	0
01-154-2-LW	0	0	0	30	40	0
01-162-4-LW	0	0	0	30	40	0
01-218-1-LW	0	0	0	30	40	0
01-218-2-LW	0	0	0	30	40	0
01-222-0-LW	0	0	0	30	40	0
01-239-1-LW	0	0	0	30	40	0
01-239-2-LW	0	0	0	30	40	0
01-255-1-LW	0	0	0	30	40	0
01-255-4-LW	0	0	0	30	40	0
01-255-5-LW	0	0	0	30	40	0
01-271-6-LW	0	0	0	30	40	0
01-277-1-LW	0	0	0	30	40	0
01-277-3-LW	0	0	0	30	40	0
01-278-2-LW	0	0	0	30	40	0
01-292-6-LW	0	0	0	30	40	0
01-298-2-LW	0	0	0	30	40	0
01-311-4-LW	0	0	0	30	40	0
02-113-2-LW	0	0	0	30	40	0
02-116-1-LW	0	0	0	30	40	0
02-120-4-LW	0	0	0	30	40	0
02-122-1-LW	0	0	0	30	40	0
02-132-2-LW	0	0	0	30	40	0
02-136-1-LW	0	0	0	30	40	0
02-136-2-LW	0	0	0	30	40	0
02-152-2-LW	0	0	0	30	40	0
02-154-1-LW	0	0	0	30	40	0
02-162-4-LW	0	0	0	30	40	0
02-171-1-LW	0	0	0	30	40	0
03-117-2-LW	0	0	0	30	40	0
04-126-2-LW	0	0	0	30	40	0
1-100-4-LW	0	0	0	30	40	0
1-162-5-LW	0	0	0	30	40	0
1-213-1-LW	0	0	0	30	40	0
1-302-2-LW	0	0	0	30	40	0
2-111-1-LW	0	0	0	30	40	0
2-111-2-LW	0	0	0	30	40	0
2-121-1-LW	0	0	0	30	40	0
2-121-2-LW	0	0	0	30	40	0
2-125-2-LW	0	0	0	30	40	0
2-281-1-LW	0	0	0	30	40	0
2-281-2-LW	0	0	0	30	40	0
2-284-1-LW	0	0	0	30	40	0
2-284-2-LW	0	0	0	30	40	0
2-291-1-LW	0	0	0	30	40	0
2-291-2-LW	0	0	0	30	40	0
2-295-1-LW	0	0	0	30	40	0
2-295-4-LW	0	0	0	30	40	0

Use ID: M

1-210-0-M	90	40	0	0	0	0
2-61-1-M	90	40	0	0	0	0

Use ID: Q

01-126-1-Q	0	0	0	20	40	0

01-311-2-Q	0	0	0	20	40	0
02-129-1-Q	0	0	0	20	40	0
02-228-0-Q	0	0	0	0	0	0
03-105-0-Q	0	0	0	20	40	0
03-105-1-A	0	0	0	20	40	0
03-106-2-A	0	0	0	20	40	0
03-154-1-Q	0	0	0	20	40	0
03-228-0-Q	0	0	0	0	0	0
1-105-0-Q	0	0	0	20	40	0
1-119-1-Q	0	0	0	20	40	0
1-132-1-Q	80	50	0	10	30	0
1-162-4-Q	0	0	0	20	40	0
1-199-3-L	0	0	0	20	40	0
1-22-0-Q	80	30	0	10	20	0
1-239-2-A	0	0	0	20	40	0
1-245-1-Q	0	0	0	20	40	0
1-255-0-Q	0	0	0	20	40	0
1-271-2-Q	0	0	0	20	40	0
1-326-0-Q	0	0	0	20	40	0
1-4-2-Q	0	0	0	20	40	0
1-49-5-Q	0	0	0	20	40	0
2-148-3-Q	0	0	0	20	40	0
2-162-4-Q	0	0	0	20	40	0
2-162-5-Q	0	0	0	20	40	0
2-180-1-Q	0	0	0	20	40	0
2-195-2-Q	0	0	0	20	40	0
2-205-1-Q	0	0	0	20	40	0
2-210-0-Q	0	0	0	20	40	0
2-223-3-Q	0	0	0	20	40	0
2-223-4-Q	0	0	0	20	40	0
2-251-2-A	0	0	0	20	40	0
2-262-1-Q	0	0	0	20	40	0
2-311-0-Q	80	30	0	10	30	0
2-95-2-Q	0	0	0	20	40	0
3-331-1-Q	0	0	0	20	40	0

Use ID: QF

01-239-8-A	0	0	0	20	50	0
03-162-2-Q	0	0	0	20	50	0
03-162-3-Q	0	0	0	20	50	0
1-49-0-Q	0	0	0	20	50	0
2-262-2-QF	0	0	0	20	50	0

Use ID: QO

01-271-2-Q	0	0	0	60	40	0
02-218-0-QO	0	0	0	60	40	0
03-218-0-Q	0	0	0	60	40	0
04-126-0-Q	0	0	0	60	40	0
1-100-6-Q	0	0	0	60	40	0
1-178-4-QO	0	0	0	60	40	0
1-178-6-QO	0	0	0	60	40	0
1-187-2-QO	0	0	0	60	40	0
1-198-2-QO	0	0	0	60	40	0
1-206-2-QO	0	0	0	60	40	0
1-210-1-Q	0	0	0	60	40	0
1-210-2-Q	0	0	0	60	40	0

1-89-2-QO	0	0	0	60	40	0
2-130-2-QO	0	0	0	60	40	0
2-146-2-Q	0	0	0	60	40	0
2-210-01-Q	0	0	0	60	40	0

Use ID: QS

01-295-1-Q	0	0	0	30	40	0
01-312-2-Q	0	0	0	30	40	0
1-239-[illegible]-Q	0	0	0	30	40	0
1-271-[illegible]-Q	0	0	0	30	40	0
1-287-2-Q	0	0	0	30	40	0
1-295-1-Q	0	0	0	30	40	0
1-328-1-Q	0	0	0	0	0	0
1-328-2-Q	0	0	0	0	0	0
1-328-4-Q	0	0	0	0	0	0

Use ID: T

01-138-1-T	0	0	0	30	40	0
02-138-1-T	0	0	0	30	40	0
1-138-1-T	0	0	0	30	40	0
1-145-1-T	0	0	0	30	40	0
1-169-2-T	0	0	0	30	40	0
1-311-2-T	0	0	0	30	40	0
2-145-1-T	0	0	0	30	40	0
2-169-2-T	0	0	0	30	40	0
2-311-2-T	0	0	0	30	40	0
3-311-2-T	0	0	0	30	40	0

Use ID: TS

01-100-1-TS	0	0	0	30	40	0
01-145-2-TS	0	0	0	30	40	0
01-162-1-TS	0	0	0	30	40	0
01-261-2-TS	0	0	0	30	40	0
02-100-3-TS	0	0	0	30	40	0
02-145-2-TS	0	0	0	30	40	0
02-162-1-TS	0	0	0	30	40	0
03-129-1-TS	0	0	0	30	40	0
03-145-2-TS	0	0	0	30	40	0
03-165-1-TS	0	0	0	30	40	0
1-100-1-TS	0	0	0	30	40	0
1-145-2-TS	0	0	0	30	40	0
1-162-1-TS	0	0	0	30	40	0
1-213-2-TS	0	0	0	30	40	0
1-255-2-TS	0	0	0	30	40	0
1-278-2-TS	0	0	0	30	40	0
2-105-1-TS	0	0	0	30	40	0
2-145-2-TS	0	0	0	30	40	0
2-162-1-TS	0	0	0	30	40	0
2-210-2-TS	0	0	0	30	40	0
2-256-1-TS	0	0	0	30	40	0
2-256-2-TS	0	0	0	30	40	0
2-275-2-TS	0	0	0	30	40	0
2-279-1-TS	0	0	0	30	40	0

Use ID: TU

01-145-0-TU	0	0	0	0	0	0
01-162-0-TU	0	0	0	0	0	0
02-145-0-TU	0	0	0	0	0	0
02-162-0-TU	0	0	0	0	0	0
03-145-0-TU	0	0	0	0	0	0
03-162-0-TU	0	0	0	0	0	0
04-145-0-TU	0	0	0	0	0	0
04-162-0-TU	0	0	0	0	0	0
1-145-0-TU	0	0	0	0	0	0
1-162-0-TU	0	0	0	0	0	0
2-145-0-TU	0	0	0	0	0	0
2-162-0-TU	0	0	0	0	0	0

Use ID: U

1-49-7-U	0	0	0	0	0	0
3-145-1-U	0	0	0	0	0	0
3-162-2-U	0	0	0	0	0	0
3-46-1-U	0	0	0	0	0	0
3-46-2-U	0	0	0	0	0	0
5-45-0-U	0	0	0	0	0	0

Use ID: W

01-178-0-W	0	0	0	0	0	0
01-178-2-W	0	0	0	0	0	0
01-178-3-W	0	0	0	0	0	0
02-178-2-W	0	0	0	0	0	0
02-178-3-W	0	0	0	0	0	0
2-014-0-W	0	0	0	0	0	0
4-262-0-W	0	0	0	0	0	0
4-31-0-W	0	0	0	0	0	0
4-311-0-W	0	0	0	0	0	0

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APPENDIX L

Flame Movement Analysis Results for the PIR

Appendix L displays several sets of simulation results. All sets show the relative frequency of failure for each compartment when that compartment is considered as a target. The simulations used a worst case scenario. Factors making each simulation unique are described before the results.

Glossary

Target - A compartment whose vulnerability to fire loss is being tested.

Worst case - Established Burning in a room other than the room of origin is begun when there is a probability of a durability failure or thermal failure > 0. A barrier is considered destroyed when the probability of durability failure > 0.

Relative Frequency of Failure - The likelihood of a target's loss due to fire initiated in all possible compartments of fire origin.

Frequency uloss - The threshold frequency of the unacceptable loss. It is expressed as the number of times the compartment can be lost per ship year.

Fraction of Frequency Uloss - Relative Frequency of Failure divided by Frequency Uloss

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APPENDIX L1

Options in effect for information below include:

All doors closed
A WORST CASE scenario
Passive Fire Protection only
Simulation ran for 40 minutes

Target room	Unacceptable Loss Freq	Rel Freq of Failure|FFS	Fraction of Unacceptable Loss Freq
01-100-0-LL	0.100000	0.000480	0.0048
01-100-1-TS	0.100000	0.000000	0.0000
01-100-2-LP	0.100000	0.000005	0.0001
01-100-3-L	0.100000	0.000640	0.0064
01-100-4-L	0.100000	0.000680	0.0068
01-106-2-LW	0.100000	0.000000	0.0000
01-111-1-LW	0.100000	0.000000	0.0000
01-113-2-L	0.100000	0.000680	0.0068
01-114-1-LP	0.100000	0.000005	0.0001
01-117-2-LW	0.100000	0.000000	0.0000
01-118-1-LW	0.100000	0.000000	0.0000
01-118-3-L	0.100000	0.000640	0.0064
01-125-2-LW	0.100000	0.000000	0.0000
01-125-4-L	0.100000	0.000680	0.0068
01-126-1-Q	1.000000	0.000210	0.0002
01-132-1-LW	0.100000	0.000000	0.0000
01-132-3-L	0.100000	0.000640	0.0064
01-138-1-T	1.000000	0.000000	0.0000
01-142-2-L	0.100000	0.000720	0.0072
01-145-2-TS	0.100000	0.000000	0.0000
01-146-1-LW	0.100000	0.000000	0.0000
01-146-3-L	1.000000	0.000640	0.0006
01-153-1-A	0.330000	0.000630	0.0019
01-154-2-LW	0.100000	0.000000	0.0000
01-162-1-TS	0.100000	0.000000	0.0000
01-162-2-LP	0.100000	0.000005	0.0001
01-162-3-LP	0.100000	0.000005	0.0001
01-162-4-LW	0.100000	0.000000	0.0000
01-162-5-A	1.000000	0.000855	0.0009
01-162-6-L	0.100000	0.000680	0.0068
01-178-1-LP	0.100000	0.000005	0.0001
01-218-1-LW	0.100000	0.000000	0.0000
01-218-2-LW	0.100000	0.000000	0.0000
01-218-3-A	1.000000	0.000720	0.0007
01-218-4-A	1.000000	0.000720	0.0007
01-218-5-LP	0.100000	0.000005	0.0001
01-218-6-LP	0.100000	0.000005	0.0001
01-218-8-A	0.330000	0.000630	0.0019
01-222-0-LW	0.100000	0.000000	0.0000
01-222-1-L	0.100000	0.000640	0.0064

01-222-2-L	0.100000	0.000640	0.0064
01-225-0-L	0.100000	0.000640	0.0064
01-239-1-LW	0.100000	0.000000	0.0000
01-239-2-LW	0.100000	0.000000	0.0000
01-239-3-L	0.100000	0.000640	0.0064
01-239-4-L	0.100000	0.000640	0.0064
01-239-6-LP	0.100000	0.000005	0.0001
01-239-8-A	0.330000	0.000000	0.0000
01-255-0-L	0.100000	0.000640	0.0064
01-255-1-LW	0.100000	0.000000	0.0000
01-255-10-A	0.330000	0.000630	0.0019
01-255-2-L	0.100000	0.000640	0.0064
01-255-3-L	0.100000	0.000640	0.0064
01-255-4-LW	0.100000	0.000000	0.0000
01-255-5-LW	0.100000	0.000000	0.0000
01-255-6-LP	0.100000	0.000005	0.0001
01-255-8-A	1.000000	0.000630	0.0006
01-261-2-TS	0.100000	0.000000	0.0000
01-271-1-L	0.100000	0.000640	0.0064
01-271-2-Q	1.000000	0.000413	0.0004
01-271-4-L	0.100000	0.000640	0.0064
01-271-6-LW	0.100000	0.000000	0.0000
01-271-8-L	0.100000	0.000640	0.0064
01-277-1-LW	0.100000	0.000000	0.0000
01-277-3-LW	0.100000	0.000000	0.0000
01-277-5-L	0.100000	0.000640	0.0064
01-278-2-LW	0.100000	0.000000	0.0000
01-292-2-LP	0.100000	0.000005	0.0001
01-292-4-L	0.100000	0.000640	0.0064
01-292-6-LW	0.100000	0.000000	0.0000
01-292-8-L	0.100000	0.000640	0.0064
01-298-2-LW	0.100000	0.000000	0.0000
01-311-2-Q	1.000000	0.003402	0.0034
01-311-4-LW	0.100000	0.000000	0.0000
01-311-6-L	0.100000	0.000640	0.0064
01-312-2-Q	1.000000	0.001955	0.0020
01-319-0-C	0.100000	0.000282	0.0028
02-100-1-LL	0.100000	0.000480	0.0048
02-100-2-L	0.100000	0.000640	0.0064
02-100-3-TS	0.100000	0.000000	0.0000
02-100-4-L	0.100000	0.000640	0.0064
02-100-5-L	0.100000	0.000640	0.0064
02-113-2-LW	0.100000	0.000000	0.0000
02-115-1-LP	0.100000	0.000005	0.0001
02-116-1-LW	0.100000	0.000000	0.0000
02-120-2-L	0.100000	0.000640	0.0064
02-120-4-LW	0.100000	0.000000	0.0000
02-120-6-L	0.100000	0.000640	0.0064
02-121-2-LP	0.100000	0.000005	0.0001
02-122-1-LW	0.100000	0.000000	0.0000
02-122-3-L	0.100000	0.000640	0.0064
02-129-1-Q	1.000000	0.000210	0.0002
02-132-2-LW	0.100000	0.000000	0.0000
02-136-1-LW	0.100000	0.000000	0.0000
02-136-2-LW	0.100000	0.000000	0.0000
02-136-3-L	0.100000	0.000640	0.0064

02-136-4-L	0.100000	0.000640	0.0064
02-138-1-T	1.000000	0.000000	0.0000
02-145-1-A	0.330000	0.000630	0.0019
02-145-2-TS	0.100000	0.000000	0.0000
02-146-1-L	0.100000	0.000640	0.0064
02-148-2-L	0.100000	0.000640	0.0064
02-152-2-LW	0.100000	0.000000	0.0000
02-154-1-LW	0.100000	0.000000	0.0000
02-158-2-A	1.000000	0.000720	0.0007
02-162-1-TS	0.100000	0.000000	0.0000
02-162-2-A	0.330000	0.000630	0.0019
02-162-3-L	0.100000	0.000640	0.0064
02-162-4-LW	0.100000	0.000000	0.0000
02-162-6-L	0.100000	0.000640	0.0064
02-171-1-LW	0.100000	0.000000	0.0000
02-178-0-E	0.033000	0.020400	0.6182
02-178-1-LP	0.100000	0.000005	0.0001
02-218-0-QO	0.330000	0.000384	0.0012
03-105-0-Q	0.100000	0.001152	0.0115
03-105-1-A	0.100000	0.001230	0.0123
03-106-2-A	0.100000	0.001159	0.0116
03-111-2-LP	0.100000	0.000005	0.0001
03-117-2-LW	0.100000	0.000000	0.0000
03-129-1-TS	0.100000	0.000000	0.0000
03-132-2-A	1.000000	0.000765	0.0008
03-140-1-LP	0.100000	0.000005	0.0001
03-145-2-TS	0.100000	0.000000	0.0000
03-147-1-A	0.100000	0.000630	0.0063
03-154-1-Q	0.330000	0.000960	0.0029
03-157-1-A	0.330000	0.000630	0.0019
03-157-2-A	1.000000	0.000720	0.0007
03-162-1-A	1.000000	0.000720	0.0007
03-162-2-Q	0.100000	0.000000	0.0000
03-162-3-Q	0.100000	0.000000	0.0000
03-165-1-TS	0.100000	0.000000	0.0000
03-178-2-E	0.033000	0.014280	0.4327
03-218-0-Q	0.100000	0.000320	0.0032
04-108-0-C	0.033000	0.000368	0.0112
04-126-0-Q	0.033000	0.000320	0.0097
04-126-2-LW	0.100000	0.000000	0.0000
04-126-4-A	1.000000	0.000720	0.0007
04-132-2-L	0.100000	0.000659	0.0066
1-028-0-K	0.033000	0.001500	0.0455
1-100-0-LP	0.100000	0.000005	0.0001
1-100-1-TS	0.100000	0.000000	0.0000
1-100-2-LP	0.100000	0.000000	0.0000
1-100-3-LP	0.100000	0.000005	0.0001
1-100-5-LL	0.100000	0.000360	0.0036
1-100-6-Q	1.000000	0.000320	0.0003
1-105-0-Q	0.100000	0.000210	0.0021
1-119-1-Q	0.100000	0.000000	0.0000
1-124-2-LL	0.100000	0.000960	0.0096
1-132-1-Q	0.100000	0.002640	0.0264
1-138-1-T	1.000000	0.000000	0.0000
1-145-1-T	1.000000	0.000000	0.0000
1-145-2-TS	0.100000	0.000000	0.0000

1-154-1-A	0.330000	0.000630	0.0019
1-162-1-TS	0.100000	0.000000	0.0000
1-162-2-LP	0.100000	0.000005	0.0001
1-162-3-LP	0.100000	0.000005	0.0001
1-162-4-Q	1.000000	0.000482	0.0005
1-162-5-LW	0.100000	0.000000	0.0000
1-162-6-A	0.330000	0.000630	0.0019
1-162-7-L	0.100000	0.000651	0.0065
1-169-2-T	1.000000	0.000000	0.0000
1-174-1-L	0.330000	0.000767	0.0023
1-174-3-L	0.100000	0.000647	0.0065
1-178-1-E	0.033000	0.045200	1.3697
1-178-2-E	0.033000	0.045200	1.3697
1-178-4-QO	1.000000	0.000322	0.0003
1-178-6-QO	1.000000	0.000320	0.0003
1-187-2-QO	1.000000	0.000322	0.0003
1-198-2-QO	1.000000	0.000320	0.0003
1-199-1-L	0.330000	0.000689	0.0021
1-199-3-L	0.330000	0.001840	0.0056
1-206-2-OO	1.000000	0.000320	0.0003
1-207-1-A	0.100000	0.000720	0.0072
1-207-2-LP	0.100000	0.000005	0.0001
1-207-3-A	1.000000	0.000810	0.0008
1-207-5-A	1.000000	0.000925	0.0009
1-210-0-M	0.330000	0.000103	0.0003
1-210-1-Q	1.000000	0.000320	0.0003
1-210-2-Q	1.000000	0.000320	0.0003
1-210-3-A	1.000000	0.000720	0.0007
1-213-2-TS	0.100000	0.000000	0.0000
1-217-2-A	1.000000	0.000810	0.0008
1-218-2-A	1.000000	0.000820	0.0008
1-22-0-Q	0.100000	0.000000	0.0000
1-223-0-C	1.000000	0.000960	0.0010
1-223-2-LP	0.100000	0.000030	0.0003
1-223-4-A	1.000000	0.000810	0.0008
1-233-2-A	0.330000	0.000630	0.0019
1-239-0-Q	0.100000	0.001955	0.0195
1-239-1-LP	0.100000	0.000005	0.0001
1-239-2-A	1.000000	0.001840	0.0018
1-245-1-Q	0.100000	0.000000	0.0000
1-255-0-Q	0.100000	0.001955	0.0195
1-255-2-TS	0.100000	0.000000	0.0000
1-271-0-Q	0.100000	0.001002	0.0100
1-271-2-Q	0.330000	0.000094	0.0003
1-278-2-TS	0.100000	0.000000	0.0000
1-287-2-Q	0.100000	0.000737	0.0074
1-295-1-Q	0.100000	0.000000	0.0000
1-302-2-LW	0.100000	0.000000	0.0000
1-307-2-A	1.000000	0.000861	0.0009
1-311-2-T	1.000000	0.000000	0.0000
1-319-0-LP	0.100000	0.000023	0.0002
1-344-0-K	0.033000	0.001500	0.0455
1-4-0-A	0.330000	0.000630	0.0019
1-4-2-Q	0.100000	0.001869	0.0187
1-49-0-Q	0.330000	0.000000	0.0000
1-49-1-LP	0.100000	0.000006	0.0001

1-49-2-LP	0.100000	0.000006	0.0001
1-49-4-A	0.330000	0.000655	0.0020
1-49-5-Q	0.100000	0.000000	0.0000
1-52-0-LP	0.100000	0.000007	0.0001
1-64-2-A	0.100000	0.000706	0.0071
1-89-2-QO	1.000000	0.000392	0.0004
1-89-4-A	0.330000	0.000653	0.0020
2-100-0-LP	0.100000	0.000005	0.0001
2-100-1-L	0.100000	0.000720	0.0072
2-100-2-L	0.100000	0.000720	0.0072
2-100-3-A	1.000000	0.000720	0.0007
2-100-4-L	0.100000	0.000720	0.0072
2-100-5-A	1.000000	0.000456	0.0005
2-100-7-LL	0.100000	0.000480	0.0048
2-105-1-TS	0.100000	0.000000	0.0000
2-111-1-LW	0.100000	0.000000	0.0000
2-111-2-LW	0.100000	0.000000	0.0000
2-121-1-LW	0.100000	0.000000	0.0000
2-121-2-LW	0.100000	0.000000	0.0000
2-121-3-L	0.100000	0.000720	0.0072
2-121-4-L	0.100000	0.000720	0.0072
2-125-2-LW	0.100000	0.000000	0.0000
2-130-2-QO	1.000000	0.000320	0.0003
2-134-1-LL	0.100000	0.000489	0.0049
2-145-1-T	1.000000	0.000000	0.0000
2-145-2-TS	0.100000	0.000000	0.0000
2-146-2-Q	1.000000	0.000320	0.0003
2-148-1-Q	1.000000	0.000630	0.0006
2-148-3-Q	1.000000	0.000420	0.0004
2-154-1-A	0.330000	0.000630	0.0019
2-157-2-A	1.000000	0.000720	0.0007
2-162-1-TS	0.100000	0.000000	0.0000
2-162-2-LP	0.100000	0.000005	0.0001
2-162-3-LP	0.100000	0.000005	0.0001
2-162-4-Q	1.000000	0.002070	0.0021
2-162-5-Q	0.330000	0.001440	0.0044
2-169-2-T	1.000000	0.000000	0.0000
2-178-1-E	0.033000	0.045200	1.3697
2-178-2-E	0.033000	0.045200	1.3697
2-180-1-Q	0.330000	0.001440	0.0044
2-195-1-A	0.100000	0.000846	0.0085
2-195-2-Q	0.100000	0.000630	0.0063
2-205-1-Q	1.000000	0.001955	0.0020
2-210-0-Q	0.100000	0.000630	0.0063
2-210-01-Q	0.100000	0.000320	0.0032
2-210-2-TS	0.100000	0.000000	0.0000
2-22-0-A	0.330000	0.000630	0.0019
2-223-0-C	0.033000	0.001032	0.0313
2-223-1-LP	0.100000	0.000005	0.0001
2-223-2-LP	0.100000	0.000005	0.0001
2-223-3-Q	0.033000	0.001164	0.0353
2-223-4-Q	0.033000	0.001164	0.0353
2-251-2-A	1.000000	0.001176	0.0012
2-256-1-TS	0.100000	0.000000	0.0000
2-256-2-TS	0.100000	0.000000	0.0000
2-262-1-Q	0.100000	0.001128	0.0113

2-262-2-QF	0.100000	0.000000	0.0000
2-271-1-L	0.100000	0.000720	0.0072
2-271-2-L	0.100000	0.000720	0.0072
2-271-3-LP	0.100000	0.000005	0.0001
2-271-4-LP	0.100000	0.000005	0.0001
2-271-5-L	0.100000	0.000720	0.0072
2-271-6-L	0.100000	0.000720	0.0072
2-275-2-TS	0.100000	0.000000	0.0000
2-279-1-TS	0.100000	0.000000	0.0000
2-281-1-LW	0.100000	0.000000	0.0000
2-281-2-LW	0.100000	0.000000	0.0000
2-284-1-LW	0.100000	0.000000	0.0000
2-284-2-LW	0.100000	0.000000	0.0000
2-291-1-LW	0.100000	0.000000	0.0000
2-291-2-LW	0.100000	0.000000	0.0000
2-291-3-L	0.100000	0.000720	0.0072
2-291-4-L	0.100000	0.000720	0.0072
2-295-1-LW	0.100000	0.000000	0.0000
2-295-2-L	0.100000	0.000720	0.0072
2-295-3-L	0.100000	0.000720	0.0072
2-295-4-LW	0.100000	0.000000	0.0000
2-311-0-Q	0.100000	0.000000	0.0000
2-311-2-T	1.000000	0.000000	0.0000
2-343-0-A	0.330000	0.000630	0.0019
2-343-2-A	1.000000	0.000819	0.0008
2-343-3-C	0.330000	0.000968	0.0029
2-361-1-E	0.033000	0.006862	0.2079
2-361-2-E	0.033000	0.006862	0.2079
2-388-1-A	0.330000	0.000630	0.0019
2-388-2-A	0.330000	0.000630	0.0019
2-4-0-A	0.330000	0.000630	0.0019
2-49-0-AA	0.100000	0.000630	0.0063
2-49-1-A	1.000000	0.000720	0.0007
2-61-1-M	0.330000	0.000995	0.0003
2-65-1-Q	0.330000	0.000765	0.0023
2-65-2-C	0.330000	0.000960	0.0029
2-95-2-Q	0.100000	0.000840	0.0084
3-100-0-E	0.033000	0.047400	1.4364
3-162-0-E	0.033000	0.047400	1.4364
3-22-0-A	0.330000	0.000630	0.0019
3-223-0-E	0.033000	0.003100	0.0939
3-271-0-E	0.100000	0.003300	0.0330
3-311-0-AA	0.100000	0.000630	0.0063
3-311-2-T	1.000000	0.000000	0.0000
3-4-0-A	0.330000	0.000630	0.0019
3-49-0-AA	0.100000	0.000630	0.0063
4-100-0-E	0.033000	0.047400	1.4364
4-162-0-E	0.033000	0.047400	1.4364
4-223-0-E	0.033000	0.003100	0.0939
4-271-0-E	0.033000	0.002000	0.0606
4-49-0-E	0.033000	0.002000	0.0606
5-100-0-E	0.033000	0.047400	1.4364
5-162-0-E	0.033000	0.047400	1.4364
5-223-0-E	0.033000	0.003100	0.0939
5-49-0-E	0.100000	0.003300	0.0330
5-76-0-E	0.100000	0.003300	0.0330

APPENDIX L2

Options in effect for information below include:

All doors except accomodation space doors closed
A WORST CASE scenario
Passive Fire Protection only
Simulation ran for 40 minutes

Target room	Unacceptable Loss Freq	Rel Freq of Failure|FFS	Fraction of Unacceptable Loss Freq
01-100-0-LL	0.100000	0.007541	0.0754
01-100-1-TS	0.100000	0.000000	0.0000
01-100-2-LP	0.100000	0.003823	0.0382
01-100-3-L	0.100000	0.002534	0.0253
01-100-4-L	0.100000	0.002161	0.0216
01-106-2-LW	0.100000	0.000000	0.0000
01-111-1-LW	0.100000	0.000000	0.0000
01-113-2-L	0.100000	0.002501	0.0250
01-114-1-LP	0.100000	0.002844	0.0284
01-117-2-LW	0.100000	0.000000	0.0000
01-118-1-LW	0.100000	0.000000	0.0000
01-118-3-L	0.100000	0.002469	0.0247
01-125-2-LW	0.100000	0.000000	0.0000
01-125-4-L	0.100000	0.002696	0.0270
01-126-1-Q	1.000000	0.002529	0.0025
01-132-1-LW	0.100000	0.000000	0.0000
01-132-3-L	0.100000	0.002217	0.0222
01-138-1-T	1.000000	0.000000	0.0000
01-142-2-L	0.100000	0.002998	0.0300
01-145-2-TS	0.100000	0.000000	0.0000
01-146-1-LW	0.100000	0.000000	0.0000
01-146-3-L	1.000000	0.003047	0.0030
01-153-1-A	0.330000	0.002909	0.0088
01-154-2-LW	0.100000	0.000000	0.0000
01-162-1-TS	0.100000	0.000000	0.0000
01-162-2-LP	0.100000	0.000142	0.0014
01-162-3-LP	0.100000	0.000005	0.0001
01-162-4-LW	0.100000	0.000000	0.0000
01-162-5-A	1.000000	0.000855	0.0009
01-162-6-L	0.100000	0.000685	0.0068
01-178-1-LP	0.100000	0.000640	0.0064
01-218-1-LW	0.100000	0.000000	0.0000
01-218-2-LW	0.100000	0.000000	0.0000
01-218-3-A	1.000000	0.008964	0.0090
01-218-4-A	1.000000	0.004094	0.0041
01-218-5-LP	0.100000	0.004781	0.0478
01-218-6-LP	0.100000	0.002919	0.0292
01-218-8-A	0.330000	0.001462	0.0044
01-222-0-LW	0.100000	0.000000	0.0000
01-222-1-L	0.100000	0.006230	0.0623

01-222-2-L	0.100000	0.004622	0.0462
01-225-0-L	0.100000	0.005301	0.0530
01-239-1-LW	0.100000	0.000000	0.0000
01-239-2-LW	0.100000	0.000000	0.0000
01-239-3-L	0.100000	0.005121	0.0512
01-239-4-L	0.100000	0.004402	0.0440
01-239-6-LP	0.100000	0.000868	0.0087
01-239-8-A	0.330000	0.000000	0.0000
01-255-0-L	0.100000	0.005489	0.0549
01-255-1-LW	0.100000	0.000000	0.0000
01-255-10-A	0.330000	0.000630	0.0019
01-255-2-L	0.100000	0.004938	0.0494
01-255-3-L	0.100000	0.004540	0.0454
01-255-4-LW	0.100000	0.000000	0.0000
01-255-5-LW	0.100000	0.000000	0.0000
01-255-6-LP	0.100000	0.001249	0.0125
01-255-8-A	1.000000	0.001633	0.0016
01-261-2-TS	0.100000	0.000000	0.0000
01-271-1-L	0.100000	0.010210	0.1021
01-271-2-Q	1.000000	0.010295	0.0103
01-271-4-L	0.100000	0.001461	0.0146
01-271-6-LW	0.100000	0.000000	0.0000
01-271-8-L	0.100000	0.003302	0.0330
01-277-1-LW	0.100000	0.000000	0.0000
01-277-3-LW	0.100000	0.000000	0.0000
01-277-5-L	0.100000	0.007802	0.0780
01-278-2-LW	0.100000	0.000000	0.0000
01-292-2-LP	0.100000	0.004175	0.0418
01-292-4-L	0.100000	0.005017	0.0502
01-292-6-LW	0.100000	0.000000	0.0000
01-292-8-L	0.100000	0.004478	0.0448
01-298-2-LW	0.100000	0.000000	0.0000
01-311-2-Q	1.000000	0.010947	0.0109
01-311-4-LW	0.100000	0.000000	0.0000
01-311-6-L	0.100000	0.000640	0.0064
01-312-2-Q	1.000000	0.010947	0.0109
01-319-0-C	0.100000	0.007717	0.0772
02-100-1-LL	0.100000	0.007995	0.0799
02-100-2-L	0.100000	0.005662	0.0566
02-100-3-TS	0.100000	0.000000	0.0000
02-100-4-L	0.100000	0.005541	0.0554
02-100-5-L	0.100000	0.003231	0.0323
02-113-2-LW	0.100000	0.000000	0.0000
02-115-1-LP	0.100000	0.002281	0.0228
02-116-1-LW	0.100000	0.000000	0.0000
02-120-2-L	0.100000	0.010206	0.1021
02-120-4-LW	0.100000	0.000000	0.000
02-120-6-L	0.100000	0.004604	0.0460
02-121-2-LP	0.100000	0.004024	0.0402
02-122-1-LW	0.100000	0.000000	0.0000
02-122-3-L	0.100000	0.002531	0.0253
02-129-1-Q	1.000000	0.006175	0.0062
02-132-2-LW	0.100000	0.000000	0.0000
02-136-1-LW	0.100000	0.000000	0.0000
02-136-2-LW	0.100000	0.000000	0.0000
02-136-3-L	0.100000	0.003352	0.0335

02-136-4-L	0.100000	0.007181	0.0718
02-138-1-T	1.000000	0.000000	0.0000
02-145-1-A	0.330000	0.002456	0.0074
02-145-2-TS	0.100000	0.000000	0.0000
02-146-1-L	0.100000	0.002297	0.0230
02-148-2-L	0.100000	0.004411	0.0441
02-152-2-LW	0.100000	0.000000	0.0000
02-154-1-LW	0.100000	0.000000	0.[illegible]
02-158-2-A	1.000000	0.004352	0.0044
02-162-1-TS	0.100000	0.000000	0.0000
02-162-2-A	0.330000	0.003860	0.0117
02-162-3-L	0.100000	0.002544	0.0254
02-162-4-LW	0.100000	0.000000	0.0000
02-162-6-L	0.100000	0.004205	0.0421
02-171-1-LW	0.100000	0.000000	0.0000
02-178-0-E	0.033000	0.020400	0.6182
02-178-1-LP	0.100000	0.000354	0.0035
02-218-0-QO	0.330000	0.002137	0.0065
03-105-0-Q	0.100000	0.001452	0.0145
03-105-1-A	0.100000	0.002570	0.0257
03-106-2-A	0.100000	0.001551	0.0155
03-111-2-LP	0.100000	0.000105	0.0011
03-117-2-LW	0.100000	0.000000	0.0000
03-129-1-TS	0.100000	0.000000	0.0000
03-132-2-A	1.000000	0.000827	0.0008
03-140-1-LP	0.100000	0.000297	0.0030
03-145-2-TS	0.100000	0.000000	0.0000
03-147-1-A	0.100000	0.000630	0.0063
03-154-1-Q	0.330000	0.000960	0.0029
03-157-1-A	0.330000	0.000809	0.0025
03-157-2-A	1.000000	0.000720	0.0007
03-162-1-A	1.000000	0.000922	0.0009
03-162-2-Q	0.100000	0.000000	0.0000
03-162-3-Q	0.100000	0.000000	0.0000
03-165-1-TS	0.100000	0.000000	0.0000
03-178-2-E	0.033000	0.014280	0.4327
03-218-0-Q	0.100000	0.000320	0.0032
04-108-0-C	0.033000	0.001181	0.0358
04-126-0-Q	0.033000	0.001434	0.0435
04-126-2-LW	0.100000	0.000000	0.0000
04-126-4-A	1.000000	0.001579	0.0016
04-132-2-L	0.100000	0.001230	0.0123
1-028-0-K	0.033000	0.001500	0.0455
1-100-0-LP	0.100000	0.000005	0.0001
1-100-1-TS	0.100000	0.000000	0.0000
1-100-2-LP	0.100000	0.000000	0.0000
1-100-3-LP	0.100000	0.000005	0.0001
1-100-5-LL	0.100000	0.006823	0.0682
1-100-6-Q	1.000000	0.006441	0.0064
1-105-0-Q	0.100000	0.003241	0.0324
1-119-1-Q	0.100000	0.000000	0.0000
1-124-2-LL	0.100000	0.006041	0.0604
1-132-1-Q	0.100000	0.002640	0.0264
1-138-1-T	1.000000	0.000000	0.0000
1-145-1-T	1.000000	0.000000	0.0000
1-145-2-TS	0.100000	0.000000	0.0000

1-154-1-A	0.330000	0.000630	0.0019
1-162-1-TS	0.100000	0.000000	0.0000
1-162-2-LP	0.100000	0.002300	0.0230
1-162-3-LP	0.100000	0.003546	0.0355
1-162-4-Q	1.000000	0.002860	0.0029
1-162-5-LW	0.100000	0.000000	0.0000
1-162-6-A	0.330000	0.002496	0.0076
1-162-7-L	0.100000	0.010121	0.1012
1-169-2-T	1.000000	0.000000	0.0000
1-174-1-L	0.330000	0.007920	0.0240
1-174-3-L	0.100000	0.006035	0.0603
1-178-1-E	0.033000	0.045200	1.3697
1-178-2-E	0.033000	0.045200	1.3697
1-178-4-QO	1.000000	0.002703	0.0027
1-178-6-QO	1.000000	0.004543	0.0045
1-187-2-QO	1.000000	0.004784	0.0048
1-198-2-QO	1.000000	0.005313	0.0053
1-199-1-L	0.330000	0.005795	0.0176
1-199-3-L	0.330000	0.006767	0.0205
1-206-2-QO	1.000000	0.004624	0.0046
1-207-1-A	0.100000	0.006326	0.0633
1-207-2-LP	0.100000	0.003499	0.0350
1-207-3-A	1.000000	0.006317	0.0063
1-207-5-A	1.000000	0.009693	0.0097
1-210-0-M	0.330000	0.002831	0.0086
1-210-1-Q	1.000000	0.003218	0.0032
1-210-2-Q	1.000000	0.000320	0.0003
1-210-3-A	1.000000	0.003704	0.0037
1-213-2-TS	0.100000	0.000000	0.0000
1-217-2-A	1.000000	0.000810	0.0008
1-218-2-A	1.000000	0.001115	0.0011
1-22-0-Q	0.100000	0.000000	0.0000
1-223-0-C	1.000000	0.004483	0.0045
1-223-2-LP	0.100000	0.003215	0.0321
1-223-4-A	1.000000	0.003805	0.0038
1-233-2-A	0.330000	0.004083	0.0124
1-239-0-Q	0.100000	0.004964	0.0496
1-239-1-LP	0.100000	0.000600	0.0060
1-239-2-A	1.000000	0.004071	0.0041
1-245-1-Q	0.100000	0.000000	0.0000
1-255-0-Q	0.100000	0.004641	0.0464
1-255-2-TS	0.100000	0.000000	0.0000
1-271-0-Q	0.100000	0.002095	0.0210
1-271-2-Q	0.330000	0.003249	0.0098
1-278-2-TS	0.100000	0.000000	0.0000
1-287-2-Q	0.100000	0.004212	0.0421
1-295-1-Q	0.100000	0.000000	0.0000
1-302-2-LW	0.100000	0.000000	0.0000
1-307-2-A	1.000000	0.003954	0.0040
1-3.1-2-T	1.000000	0.000000	0.0000
1-319-0-LP	0.100000	0.000146	0.0015
1-344-0-K	0.033000	0.001500	0.0455
1-4-0-A	0.330000	0.002109	0.0064
1-4-2-Q	0.100000	0.002377	0.0238
1-49-0-Q	0.330000	0.000000	0.0000
1-49-1-LP	0.100000	0.000005	0.0001

1-49-2-LP	0.100000	0.000108	0.0011
1-49-4-A	0.330000	0.000658	0.0020
1-49-5-Q	0.100000	0.000000	0.0000
1-52-0-LP	0.100000	0.000005	0.0001
1-64-2-A	0.100000	0.001419	0.0142
1-89-2-QO	1.000000	0.001391	0.0014
1-89-4-A	0.330000	0.001177	0.0036
2-100-0-LP	0.100000	0.005630	0.0563
2-100-1-L	0.100000	0.006474	0.0647
2-100-2-L	0.100000	0.005648	0.0565
2-100-3-A	1.000000	0.008210	0.0082
2-100-4-L	0.100000	0.005718	0.0572
2-100-5-A	1.000000	0.005025	0.0050
2-100-7-LL	0.100000	0.003644	0.0364
2-105-1-TS	0.100000	0.000000	0.0000
2-111-1-LW	0.100000	0.000000	0.0000
2-111-2-LW	0.100000	0.000000	0.0000
2-121-1-LW	0.100000	0.000000	0.0000
2-121-2-LW	0.100000	0.000000	0.0000
2-121-3-L	0.100000	0.005733	0.0573
2-121-4-L	0.100000	0.005439	0.0544
2-125-2-LW	0.100000	0.000000	0.0000
2-130-2-QO	1.000000	0.005022	0.0050
2-134-1-LL	0.100000	0.008760	0.0876
2-145-1-T	1.000000	0.000000	0.0000
2-145-2-TS	0.100000	0.000000	0.0000
2-146-2-Q	1.000000	0.005065	0.0051
2-148-1-Q	1.000000	0.004974	0.0050
2-148-3-Q	1.000000	0.008143	0.0081
2-154-1-A	0.330000	0.004575	0.0139
2-157-2-A	1.000000	0.005158	0.0052
2-162-1-TS	0.100000	0.000000	0.0000
2-162-2-LP	0.100000	0.000353	0.0035
2-162-3-LP	0.100000	0.002009	0.0201
2-162-4-Q	1.000000	0.002438	0.0024
2-162-5-Q	0.330000	0.002607	0.0079
2-169-2-T	1.000000	0.000000	0.0000
2-178-1-E	0.033000	0.045200	1.3697
2-178-2-E	0.033000	0.045200	1.3697
2-180-1-Q	0.330000	0.002609	0.0079
2-195-1-A	0.100000	0.004843	0.0484
2-195-2-Q	0.100000	0.000770	0.0077
2-205-1-Q	1.000000	0.003058	0.0031
2-210-0-Q	0.100000	0.001814	0.0181
2-210-01-Q	0.100000	0.002021	0.0202
2-210-2-TS	0.100000	0.000000	0.0000
2-22-0-A	0.330000	0.000630	0.0019
2-223-0-C	0.033000	0.002048	0.0621
2-223-1-LP	0.100000	0.000017	0.0002
2-223-2-LP	0.100000	0.000226	0.0023
2-223-3-Q	0.033000	0.001164	0.0353
2-223-4-Q	0.033000	0.001164	0.0353
2-251-2-A	1.000000	0.001176	0.0012
2-256-1-TS	0.100000	0.000000	0.0000
2-256-2-TS	0.100000	0.000000	0.0000
2-262-1-Q	0.100000	0.001128	0.0113

2-262-2-QF	0.100000	0.000000	0.0000
2-271-1-L	0.100000	0 004029	0.0403
2-271-2-L	0.100000	0.004493	0.0449
2-271-3-LP	0.100000	0.001181	0.0118
2-271-4-LP	0.100000	0.001172	0.0117
2-271-5-L	0.100000	0.001961	0.0196
2-271-6-L	0.100000	0.002423	0.0242
2-275-2-TS	0.100000	0.000000	0.0000
2-279-1-TS	0.100000	0.000000	0.0000
2-281-1-LW	0.100000	0.000000	0.0000
2-281-2-LW	0.100000	0.000000	0.0000
2-284-1-LW	0.100000	0.000000	0.0000
2-284-2-LW	0.100000	0.000000	0.0000
2-291-1-LW	0.100000	0.000000	0.0000
2-291-2-LW	0.100000	0.000000	0.0000
2-291-3-L	0.100000	0.004682	0.0468
2-291-4-L	0.100000	0.004331	0.0433
2-295-1-LW	0.100000	0.000000	0.0000
2-295-2-L	0.100000	0.001961	0.0196
2-295-3-L	0.100000	0.001690	0.0169
2-295-4-LW	0.100000	0.000000	0.0000
2-311-0-Q	0.100000	0.000000	0.0000
2-311-2-T	1.000000	0.000000	0.0000
2-343-0-A	0.330000	0.000630	0.0019
2-343-2-A	1.000000	0.000861	0.0009
2-343-3-C	0.330000	0.001008	0.0031
2-361-1-E	0.033000	0.006862	0.2079
2-361-2-E	0.033000	0.006862	0.2079
2-388-1-A	0.330000	0.000630	0.0019
2-388-2-A	0.330000	0.000630	0.0019
2-4-0-A	0.330000	0.000630	0.0019
2-49-0-AA	0.100000	0.000630	0.0063
2-49-1-A	1.000000	0.000720	0.0007
2-61-1-M	0.330000	0.000095	0.0003
2-65-1-Q	0.330000	0.000765	0.0023
2-65-2-C	0.330000	0.000960	0.0029
2-95-2-Q	0.100000	0.000840	0.0084
3-100-0-E	0.033000	0.047400	1.4364
3-162-0-E	0.033000	0.047400	1.4364
3-22-0-A	0.330000	0.000630	0.0019
3-223-0-E	0.033000	0.003100	0.0939
3-271-0-E	0.100000	0.003478	0.0348
3-311-0-AA	0.100000	0.000630	0.0063
3-311-2-T	1.000000	0.000000	0.0000
3-4-0-A	0.330000	0.000630	0.0019
3-49-0-AA	0.100000	0.000630	0.0063
4-100-0-E	0.033000	0.047400	1.4364
4-162-0-E	0.033000	0.047400	1.4364
4-223-0-E	0.033000	0.003100	0.0939
4-271-0-E	0.033000	0.002000	0.0606
4-49-0-E	0.033000	0.002000	0.0606
5-100-0-E	0.033000	0.047400	1.4364
5-162-0-E	0.033000	0.047400	1.4364
5-223-0-E	0.033000	0.003100	0.0939
5-49-0-E	0.100000	0.003300	0.0330
5-76-0-E	0.100000	0.003300	0.0330

Options in effect for information below include:

All doors except accomodation space doors closed
A WORST CASE scenario
Passive Fire Protection only
Simulation run for 40 minutes
Details of paths involving selected targets

TARGET ROOM	Unacceptable Loss Freq	Rel Freq of Failure|FFS	Fraction of Unacceptable Loss Freq
1-198-2-Q0	1.000000	0.005313	0.0053

Following is a table of all paths involving the target compartment grouped by room of origin and ordered by Cum-L within each grouping.

1-Target CumL|FFS	Target EB	Path
0.000348	11	1-162-4-Q/1-178-4-Q0/1-198-2-Q0
0.000298	17	1-162-4-Q/1-178-6-Q0/1-187-2-Q0/1-198-2-Q0
0.000297	17	1-162-4-Q/1-178-4-Q0/1-187-2-Q0/1-198-2-Q0
0.000255	17	1-162-4-Q/1-178-4-Q0/1-178-6-Q0/1-187-2-Q0/1-198-2-Q0
0.000390	17	1-162-6-A/1-162-4-Q/1-178-4-Q0/1-198-2-Q0
0.000334	23	1-162-6-A/1-162-4-Q/1-178-6-Q0/1-187-2-Q0/1-198-2-Q0
0.000332	23	1-162-6-A/1-162-4-Q/1-178-4-Q0/1-187-2-Q0/1-198-2-Q0
0.000285	23	1-162-6-A/1-162-4-Q/1-178-4-Q0/1-178-6-Q0/1-187-2-Q0/ 1-198-2-Q0
0.000274	6	1-178-4-Q0/1-198-2-Q0
0.000233	12	1-178-4-Q0/1-187-2-Q0/1-198-2-Q0
0.000199	12	1-178-4-Q0/1-178-6-Q0/1-187-2-Q0/1-198-2-Q0
0.000170	12	1-178-4-Q0/1-162-4-Q/1-178-6-Q0/1-187-2-Q0/1-198-2-Q0
0.000234	15	1-178-6-Q0/1-187-2-Q0/1-198-2-Q0
0.000232	13	1-178-6-Q0/1-178-4-Q0/1-198-2-Q0
0.000199	15	1-178-6-Q0/1-178-4-Q0/1-187-2-Q0/1-198-2-Q0
0.000198	13	1-178-6-Q0/1-162-4-Q/1-178-4-Q0/1-198-2-Q0
0.000170	15	1-178-6-Q0/1-162-4-Q/1-178-4-Q0/1-187-2-Q0/1-198-2-Q0
0.000273	8	1-187-2-Q0/1-198-2-Q0
0.000320	0	1-198-2-Q0
0.000274	8	1-206-2-Q0/1-198-2-Q0

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-162-4-Q	0.2000	0.0000		0.2000
1-178-4-Q0	0.1500	0.0500	0.000000	0.3174
1-198-2-Q0	0.1500	0.0500	0.000000	0.4195

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-162-4-Q	0.2000	0.0000		0.2000
1-178-6-QO	0.1500	0.0500	0.000000	0.3181
1-187-2-QO	0.1500	0.0500	0.000000	0.4170
1-198-2-QO	0.1500	0.0500	0.000000	0.5031

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-162-4-Q	0.2000	0.0000		0.2000
1-178-4-QO	0.1500	0.0500	0.000000	0.3174
1-187-2-QO	0.1500	0.0500	0.000000	0.4197
1-198-2-QO	0.1500	0.0500	0.000000	0.5054

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-162-4-Q	0.2000	0.0000		0.2000
1-178-4-QO	0.1500	0.0500	0.000000	0.3174
1-178-6-QO	0.1500	0.0500	0.000000	0.4176
1-187-2-QO	0.1500	0.0500	0.000000	0.5021
1-198-2-QO	0.1500	0.0500	0.000000	0.5756

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-162-6-A	0.3000	0.0000		0.3000
1-162-4-Q	0.1500	0.0500	0.000000	0.4031
1-178-4-QO	0.1500	0.0500	0.000000	0.4906
1-198-2-QO	0.1500	0.0500	0.000000	0.5669

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-162-6-A	0.3000	0.0000		0.3000
1-162-4-Q	0.1500	0.0500	0.000000	0.4031
1-178-6-QO	0.1500	0.0500	0.000000	0.4912
1-187-2-QO	0.1500	0.0500	0.000000	0.5650
1-198-2-QO	0.1500	0 0500	0.000000	0.6292

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-162-6-A	0.3000	0.0000		0.3000
1-162-4-Q	0.1500	0.0500	0.000000	0.4031
1-178-4-QO	0.1500	0.0500	0.000000	0.4906
1-187-2-QO	0.1500	0.0500	0.000000	0.5670
1-198-2-QO	0.1500	0.0500	0.000000	0.6310

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-162-6-A	0.3000	0.0000		0.3000
1-162-4-Q	0.1500	0.0500	0.000000	0.4031
1-178-4-QO	0.1500	0.0500	0.000000	0.4906
1-178-6-QO	0 1500	0.0500	0.000000	0.5655
1-187-2-QO	0.1500	0.0500	0.000000	0.6285
1-198-2-QO	0.1500	0.0500	0.000000	0.6833

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-178-4-QO	0.2000	0.0000		0.2000
1-198-2-QO	0.1500	0.0500	0.000000	0 3157

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-178-4-QO	0.2000	0.0000		0.2000
1-187-2-QO	0.1500	0.0500	0.000000	0.3160
1-198-2-QO	0.1500	0.0500	0.000000	0.4170

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-178-4-QO	0.2000	0.0000		0.2000
1-178-6-QO	0.1500	0.0500	0.000000	0.3146
1-187-2-QO	0.1500	0.0500	0.000000	0.4151
1-198-2-QO	0.1500	0.0500	0.000000	0.5015

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-178-4-QO	0.2000	0.0000		0.2000
1-162-4-Q	0.1500	0.0500	0.000000	0.3125
1-178-6-QO	0.1500	0.0500	0.000000	0.4148
1-187-2-QO	0.1500	0.0500	0.000000	0.5007
1-198-2-QO	0.1500	0.0500	0.000000	0.5744

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-178-6-QO	0.2000	0.0000		0.2000
1-187-2-QO	0.1500	0.0500	0.000000	0.3172
1-198-2-QO	0.1500	0.0500	0.000000	0.4161

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-178-6-QO	0.2000	0.0000		0.2000
1-178-4-QO	0.1500	0.0500	0.000000	0.3188

1-198-2-Q0	0.1500	0.0500	0.000000	0.4207

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-178-6-Q0	0.2000	0.0000		0.2000
1-178-4-Q0	0.1500	0.0500	0.000000	0.3188
1-187-2-Q0	0.1500	0.0500	0.000000	0.4179
1-198-2-Q0	0.1500	0.0500	0.000000	0.5022

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-178-6-Q0	0.2000	0.0000		0.2000
1-162-4-Q	0.1500	0.0500	0.000000	0.3197
1-178-4-Q0	0.1500	0.0500	0.000000	0.4185
1-198-2-Q0	0.1500	0.0500	0.000000	0.5056

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-178-6-Q0	0.2000	0.0000		0.2000
1-162-4-Q	0.1500	0.0500	0.000000	0.3197
1-178-4-Q0	0.1500	0.0500	0.000000	0.4185
1-187-2-Q0	0.1500	0.0500	0.000000	0.5032
1-198-2-Q0	0.1500	0.0500	0.000000	0.5751

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-187-2-Q0	0.2000	0.0000		0.2000
1-198-2-Q0	0.1500	0.0500	0.000000	0.3186

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-198-2-QO	0.2000	0.0000		0.2000

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-206-2-QO	0.2000	0.0000		0.2000
1-198-2-QO	0.1500	0.0500	0.000000	0.3160

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TARGET ROOM	Unacceptable Loss Freq	Rel Freq of Failure|FFS	Fraction of Unacceptable Loss Freq
1-239-0-Q	0.100000	0.004964	0.0496

Following is a table of all paths involving the target compartment grouped by room of origin and ordered by Cum-L within each grouping

1-Target CumL|FFS	Target EB	Path
0.001955	0	1-239-0-Q
0.000005	20	1-239-1-LP/1-239-0-Q
0.0000003	32	1-239-1-LP/1-223-0-C/1-239-0-Q
0.000375	29	1-239-2-A/1-223-2-LP/1-239-0-Q
0.000304	29	1-239-2-A/1-233-2-A/1-223-2-LP/1-239-0-Q
0.000013	38	1-239-2-A/1-223-2-LP/1-255-0-Q/1-239-0-Q
0.000010	38	1-239-2-A/1-233-2-A/1-223-2-LP/1-255-0-Q/1-239-0-Q
0.001955	13	1-255-0-Q/1-239-0-Q
0.000015	36	1-271-2-Q/1-223-2-LP/1-239-0-Q
0.000014	36	1-271-2-Q/1-307-2-A/1-223-2-LP/1-239-0-Q
0.000149	35	1-287-2-Q/1-271-0-Q/1-223-2-LP/1-239-0-Q
0.000141	35	1-287-2-Q/1-223-2-LP/1-239-0-Q
0.000029	35	1-287-2-Q/1-319-0-LP/1-223-2-LP/1-239-0-Q

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-239-0-Q	0.1500	0.0000		0.1500

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-239-1-LP	0.9500	0.0000		0.9500
1-239-0-Q	0.0000	0.0000	0.000000	0.9500

Specified Path Details

Room in Path	Therm	Dur	IBU	Cum-L

to Target	IAM	IAM		
1-239-1-LP	0.9500	0.0000		0.9500
1-223-0-C	0.1500	0.0500	0.000000	0.9525
1-239-0-Q	0.0000	0.0000	0.044168	0.9967

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-239-2-A	0.2000	0.0000		0.2000
1-223-2-LP	0.8000	0.4000	0.000000	0.8370
1-239-0-Q	0.0000	0.0000	0.000000	0.8370

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-239-2-A	0.2000	0.0000		0.2000
1-233-2-A	0.2000	0.1000	0.000000	0.3592
1-223-2-LP	0.8000	0.4000	0.000000	0.8678
1-239-0-Q	0.0000	0.0000	0.000000	0.8678

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-239-2-A	0.2000	0.0000		0.2000
1-223-2-LP	0.8000	0.4000	0.000000	0.8370
1-255-0-Q	0.1000	0.0500	0.000000	0.8531
1-239-0-Q	0.0000	0.0000	0.141416	0.9945

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
1-239-2-A	0.2000	0.0000		0.2000
1-233-2-A	0.2000	0.1000	0.000000	0.3592
1-223-2-LP	0.8000	0.4000	0.000000	0.8678
1-255-0-Q	0.1000	0.0500	0.000000	0.8808

1-239-0-Q	0.0000	0.0000	0.114740	0.9955

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-255-0-Q	0.1500	0.0000		0.1500
1-239-0-Q	0.0000	0.0000	0.000000	0.1500

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-255-0-Q	0.1500	0.0000		0.1500
1-239-0-Q	0.0000	0.0000	0.000000	0.1500

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-271-2-Q	0.3000	0.0000		0.3000
1-223-2-LP	0.8000	0.4000	0.000000	0.8529
1-239-0-Q	0 0000	0.0000	0.000000	0.8529

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-271-2-Q	0.3000	0.0000		0.3000
1-307-2-A	0.0500	0.0000	0.000000	0.3341
1-223-2-LP	0.8000	0.4000	0.000000	0.8627
1-239-0-Q	0 0000	0.0000	0 000000	0.8627

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L

1-287-2-Q	0.7000	0.0000		0.7000
1-271-0-Q	0.0000	0.0000	0.000000	0.7000
1-223-2-LP	0.8000	0.4000	0.000000	0.9353
1-239-0-Q	0.0000	0.0000	0.000000	0.9353

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-287-2-Q	0.7000	0.0000		0.7000
1-223-2-LP	0.8000	0.4000	0.000100	0.9387
1-239-0-Q	0.0000	0.0000	0.000000	0.9387

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
1-287-2-Q	0.7000	0.0000		0.7000
1-319-0-LP	0.8000	0.4000	0.000000	0.9387
1-223-2-LP	0.8000	0.4000	0.000000	0.9873
1-239-0-Q	0.0000	0.0000	0.000000	0.9873

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TARGET ROOM	Unacceptable Loss Freq	Rel Freq of Failure|FFS	Fraction of Unacceptable Loss Freq
2-121-4-L	0.100000	0.005439	0.0544

Following is a table of all paths involving the target compartment grouped by room of origin and ordered by Cum-L within each grouping.

1-Target CumL|FFS	Target EB	Path
0.000651	15	2-100-1-L/2-100-2-L/2-121-4-L
0.000650	15	2-100-1-L/2-121-3-L/2-121-4-L
0.000684	8	2-100-2-L/2-121-4-L
0.000137	31	2-100-4-L/2-100-0-LP/2-121-4-L
0.000119	31	2-100-4-L/2-130-2-QO/2-100-0-LP/2-121-4-L
0.000257	31	2-100-5-A/2-100-0-LP/2-121-4-L
0.000082	31	2-100-5-A/2-100-7-LL/2-100-0-LP/2-121-4-L
0.000070	31	2-100-5-A/2-100-7-LL/2-134-1-LL/2-100-0-LP/2-121-4-L
0.000684	8	2-121-3-L/2-121-4-L
0.000720	0	2-121-4-L
0.000050	35	2-130-2-QO/2-100-0-LP/2-121-4-L
0.000048	35	2-130-2-QO/2-100-4-L/2-100-0-LP/2-121-4-L
0.000044	35	2-130-2-QO/2-146-2-Q/2-100-0-LP/2-121-4-L
0.000062	37	2-134-1-LL/2-100-0-LP/2-121-4-L
0.000053	37	2-134-1-LL/2-148-1-Q/2-100-0-LP/2-121-4-L
0.000051	37	2-134-1-LL/2-148-3-Q/2-100-0-LP/2-121-4-L
0.000050	37	2-134-1-LL/2-100-7-LL/2-100-0-LP/2-121-4-L
0.000042	37	2-134-1-LL/2-148-1-Q/2-148-3-Q/2-100-0-LP/2-121-4-L
0.000035	37	2-134-1-LL/2-100-7-LL/2-100-5-A/2-100-0-LP/2-121-4-L
0.000359	29	2-148-1-Q/2-100-0-LP/2-121-4-L
0.000114	29	2-148-1-Q/2-134-1-LL/2-100-0-LP/2-121-4-L
0.000109	29	2-148-1-Q/2-148-3-Q/2-100-0-LP/2-121-4-L
0.000092	29	2-148-1-Q/2-148-3-Q/2-134-1-LL/2-100-0-LP/2-121-4-L
0.000080	33	2-148-3-Q/2-100-0-LP/2-121-4-L
0.000072	33	2-148-3-Q/2-148-1-Q/2-100-0-LP/2-121-4-L
0.000068	33	2-148-3-Q/2-134-1-LL/2-100-0-LP/2-121-4-L
0.000055	33	2-148-3-Q/2-148-1-Q/2-134-1-LL/2-100-0-LP/2-121-4-L

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-100-1-L	0.1000	0.0000		0.1000
2-100-2-L	0.0500	0.0000	0.000000	0.1439
2-121-4-L	0.0500	0.0000	0.000000	0.1862

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-100-1-L	0.1000	0.0000		0.1000
2-121-3-L	0.0500	0.0000	0.000000	0.1444
2-121-4-L	0.0500	0.0000	0.000000	0.1872

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-100-2-L	0.1000	0.0000		0.1000
2-121-4-L	0.0500	0.0000	0.000000	0.1445

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-100-4-L	0.1000	0.0000		0.1000
2-100-0-LP	0.8000	0.4000	0.000000	0.8197
2-121-4-L	0.0500	0.0000	0.000000	0.8285

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-100-4-L	0.1000	0.0000		0.1000
2-130-2-QO	0.1500	0.0500	0.000000	0.2338
2-100-0-LP	0.8000	0.4000	0.000000	0.8431
2-121-4-L	0.0500	0.0000	0.000000	0.8507

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L

2-100-5-A	0.5000	0.0000		0.5000
2-100-0-LP	0.8000	0.4000	0.000000	0.7000
2-121-4-L	0.0500	0.0000	0.000000	0.7149

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-100-5-A	0.5000	0.0000		0.5000
2-100-7-LL	0.1500	0.0500	0.000000	0.5250
2-100-0-LP	0.8000	0.4000	0.000000	0.9042
2-121-4-L	0.0500	0.0000	0.000000	0.9090

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-100-5-A	0.5000	0.0000		0.5000
2-100-7-LL	0.1500	0.0500	0.000000	0.5250
2-134-1-LL	0.1500	0.0500	0.000000	0.5949
2-100-0-LP	0.8000	0.4000	0.000000	0.9183
2-121-4-L	0.0500	0.0000	0.000000	0.9224

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-121-3-L	0.1000	0.0000		0.1000
2-121-4-L	0.0500	0.0000	0.000000	0.1450

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-121-4-L	0.1000	0.0000		0.1000

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-130-2-QO	0.2000	0.0000		0.2000
2-100-0-LP	0.8000	0.4000	0.000000	0.8385
2-121-4-L	0.0500	0.0000	0.030325	0.8754

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-130-2-QO	0.2000	0.0000		0.2000
2-100-4-L	0.0500	0.0000	0.000000	0.2397
2-100-0-LP	0.8000	0.4000	0.000000	0.8452
2-121-4-L	0.0500	0.0000	0.029061	0.8806

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-130-2-QO	0.2000	0.0000		0.2000
2-146-2-Q	0.1500	0.0500	0.000000	0.3198
2-100-0-LP	0.8000	0.4000	0.000000	0.8564
2-121-4-L	0.0500	0.0000	0.026958	0.8892

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-134-1-LL	0.2000	0.0000		0.2000
2-100-0-LP	0.8000	0.4000	0.000000	0.8305
2-121-4-L	0.0500	0.0000	0.060840	0.8968

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-134-1-LL	0.2000	0.0000		0.2000
2-148-1-Q	0.2000	0.1000	0.000000	0.3544

2-100-0-LP	0.8000	0.4000	0.000000	0.8545
2-121-4-L	0.0500	0.0000	0.052228	0.9114

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-134-1-LL	0.2000	0.0000		0.2000
2-148-3-Q	0.2000	0.1000	0.000000	0.3584
2-100-0-LP	0.8000	0.4000	0.000000	0.8605
2-121-4-L	0.0500	0.0000	0.050097	0.9150

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-134-1-LL	0.2000	0.0000		0.2000
2-100-7-LL	0.1500	0.0500	0.000000	0.3188
2-100-0-LP	0.8000	0.4000	0.000000	0.8627
2-121-4-L	0.0500	0.0000	0.049310	0.9164

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-134-1-LL	0.2000	0.0000		0.2000
2-148-1-Q	0.2000	0.1000	0.000000	0.3544
2-148-3-Q	0.2000	0.1000	0.000000	0.4772
2-100-0-LP	0.8000	0.4000	0.000000	0.8863
2-121-4-L	0.0500	0.0000	0.040819	0.9308

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-134-1-LL	0.2000	0.0000		0.2000
2-100-7-LL	0.1500	0.0500	0.000000	0.3188
2-100-5-R	0.4000	0.3000	0.000000	0.5846
2-100-0-LP	0.8000	0.4000	0.000000	0.9034
2-121-4-L	0.0500	0.0000	0.034684	0.9412

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-148-1-Q	0.3000	0.0000		0.3000
2-100-0-LP	0.8000	0.4000	0.000000	0.5800
2-121-4-L	0.0500	0.0000	0.000000	0.6007

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-148-1-Q	0.3000	0.0000		0.3000
2-134-1-LL	0.1500	0.0500	0.000000	0.3350
2-100-0-LP	0.8000	0.4000	0.000000	0.8669
2-121-4-L	0.0500	0.0000	0.000000	0.8735

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-148-1-Q	0.3000	0.0000		0.3000
2-148-3-Q	0.2000	0.1000	0.000000	0.3700
2-100-0-LP	0.8000	0.4000	0.000000	0.8729
2-121-4-L	0.0500	0.0000	0.000000	0.8792

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-148-1-Q	0.3000	0.0000		0.3000
2-148-3-Q	0.2000	0.1000	0.000000	0.3700
2-134-1-LL	0.1500	0.0500	0.000000	0.4623
2-100-0-LP	0.8000	0.4000	0.000000	0.8924
2-121-4-L	0.0500	0.0000	0.000000	0.8977

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-148-3-Q	0.3000	0.0000		0.3000
2-100-0-LP	0 8000	0.4000	0.000000	0.8600
2-121-4-L	0.0500	0.0000	0.000000	0.8669

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-148-3-Q	0 3000	0 0000		0.3000
2-148-1-Q	0.2000	0.1000	0 000000	0.4396
2-100-0-LP	0.8000	0.4000	0.000000	0.8737
2-121-4-L	0.0500	0.0000	0.000000	0.8799

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-148-3-Q	0.3000	0.0000		0.3000
2-134-1-LL	0.1500	0.0500	0.000000	0 4029
2-100-0-LP	0.8000	0.4000	0.000000	0.8805
2-121-4-L	0.0500	0.0000	0.000000	0.8864

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-148-3-Q	0.3000	0.0000		0.3000
2-148-1-Q	0.2000	0.1000	0.000000	0.4396
2-134-1-LL	0.1500	0.0500	0.000000	0.5192
2-100-0-LP	0 8000	0.4000	0.000000	0.9038
2-121-4-L	0.0500	0.0000	0.000000	0.9085

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TARGET ROOM	Unacceptable Loss Freq	Rel Freq of Failure|FFS	Fraction of Unacceptable Loss Freq
2-223-0-C	0.033000	0.002048	0.0621

Following is a table of all paths involving the target compartment grouped by room of origin and ordered by Cum-L within each grouping.

1-Target CumL|FFS	Target EB	Path
0.001032	0	2-223-0-C
0.000962	1	2-251-2-A/2-223-0-C
0.000002	24	2-251-2-A/2-223-2-LP/2-223-0-C
0.000052	17	2-262-1-Q/2-223-0-C

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-223-0-C	0.7000	0.0000		0.1400

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-251-2-A	0.1000	0.0000		0.1000
2-223-0-C	0.5500	0.2000	0.000000	0.1983

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBU	Cum-L
2-251-2-A	0.1000	0.0000		0.1000
2-223-2-LP	0.8000	0.4000	0.000000	0.8159
2-223-0-C	0.5500	0.200	0.182648	0.9987

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
2-262-1-Q	0.3000	0.0000		0 3000
2-223-0-C	0.5500	0.2000	0.651022	0.9564

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TARGET ROOM	Unacceptable Loss Freq	Rel Freq of Failure/FFS	Fraction of Unacceptable Loss Freq
3-311-0-AA	0.100000	0.000630	0.0063

Following is a table of all paths involving the target compartment grouped by room of origin and ordered by Cum-L within each grouping.

1-Target CumL/FFS	Target EB	Path
0.000630	0	3-311-0-AA

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	IBV	Cum-L
3-311-0-AA	0.3000	0.0000		0.3000

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TARGET ROOM	Unacceptable Loss Freq	Rel Freq of Failure|FFS	Fraction of Unacceptable Loss Freq
5-100-0-E	0.033000	0.047400	1.4364

Following is a table of all paths involving the target compartment grouped by room of origin and ordered by Cum-L within each grouping:

1-Target CumL|FFS	Target EB	Path
0.047400	0	5-100-0-E

Specified Path Details

Room in Path to Target	Therm IAM	Dur IAM	ISO	Cum-L
5-100-0-E	0.0000	0.0000		0.0000

APPENDIX L3

Options in effect for information below include:

All doors except accomodation space doors closed
A WORST CASE scenario
Passive Fire Protection only
Simulation ran for 60 minutes

Target room	Unacceptable Loss Freq	Rel Freq of Failure|FFS	Fraction of Unacceptable Loss Freq
01-100-0-LL	0.100000	0.007541	0.0754
01-100-1-TS	0.100000	0.000000	0.0000
01-100-2-LP	0.100000	0.003823	0.0382
01-100-3-L	0.100000	0.002534	0.0253
01-100-4-L	0.100000	0.002161	0.0216
01-106-2-LW	0.100000	0.000000	0.0000
01-111-1-LW	0.100000	0.000000	0.0000
01-113-2-L	0.100000	0.002501	0.0250
01-114-1-LP	0.100000	0.002844	0.0284
01-117-2-LW	0.100000	0.000000	0.0000
01-118-1-LW	0.100000	0.000000	0.0000
01-118-3-L	0.100000	0.002469	0.0247
01-125-2-LW	0.100000	0.000000	0.0000
01-125-4-L	0.100000	0.002696	0.0270
01-126-1-Q	1.000000	0.002529	0.0025
01-132-1-LW	0.100000	0.000000	0.0000
01-132-3-L	0.100000	0.002217	0.0222
01-138-1-T	1.000000	0.000000	0.0000
01-142-2-L	0.100000	0.002998	0.0300
01-145-2-TS	0.100000	0.000000	0.0000
01-146-1-LW	0.100000	0.000000	0.0000
01-146-3-L	1.000000	0.003047	0.0030
01-153-1-A	0.330000	0.002909	0.0088
01-154-2-LW	0.100000	0.000000	0.0000
01-162-1-TS	0.100000	0.000000	0.0000
01-162-2-LP	0.100000	0.000142	0.0014
01-162-3-LP	0.100000	0.000005	0.0001
01-162-4-LW	0.100000	0.000000	0.0000
01-162-5-A	1.000000	0.000855	0.0009
01-162-6-L	0.100000	0.000685	0.0068
01-178-1-LP	0.100000	0.000708	0.0071
01-218-1-LW	0.100000	0.000000	0.0000
01-218-2-LW	0.100000	0.000000	0.0000
01-218-3-A	1.000000	0.009793	0.0098
01-218-4-A	1.000000	0.006505	0.0065
01-218-5-LP	0.100000	0.005202	0.0520
01-218-6-LP	0.100000	0.006613	0.0661
01-218-8-A	0.330000	0.001462	0.0044
01-222-0-LW	0.100000	0.000000	0.0000
01-222-1-L	0.100000	0.006614	0.0661

01-222-2-L	0.100000	0.005362	0.0536
01-225-0-L	0.100000	0.006117	0.0612
01-239-1-LW	0.100000	0.000000	0.0000
01-239-2-LW	0.100000	0.000000	0.0000
01-239-3-L	0.100000	0.005429	0.0543
01-239-4-L	0.100000	0.004622	0.0462
01-239-6-LP	0.100000	0.000868	0.0087
01-239-8-A	0.330000	0.000000	0.0000
01-255-0-L	0.100000	0.005489	0.0549
01-255-1-LW	0.100000	0.000000	0.0000
01-255-10-A	0.330000	0.000630	0.0019
01-255-2-L	0.100000	0.004938	0.0494
01-255-3-L	0.100000	0.005093	0.0509
01-255-4-LW	0.100000	0.000000	0.0000
01-255-5-LW	0.100000	0.000000	0.0000
01-255-6-LP	0.100000	0.001249	0.0125
01-255-8-A	1.000000	0.001633	0.0016
01-261-2-TS	0.100000	0.000000	0.0000
01-271-1-L	0.100000	0.010210	0.1021
01-271-2-Q	1.000000	0.010563	0.0106
01-271-4-L	0.100000	0.001461	0.0146
01-271-6-LW	0.100000	0.000000	0.0000
01-271-8-L	0.100000	0.004302	0.0430
01-277-1-LW	0.100000	0.000000	0.0000
01-277-3-LW	0.100000	0.000000	0.0000
01-277-5-L	0.100000	0.008839	0.0884
01-278-2-LW	0.100000	0.000000	0.0000
01-292-2-LP	0.100000	0.004175	0.0418
01-292-4-L	0.100000	0.005017	0.0502
01-292-6-LW	0.100000	0.000000	0.0000
01-292-8-L	0.100000	0.004478	0.0448
01-298-2-LW	0.100000	0.000000	0.0000
01-311-2-Q	1.000000	0.011214	0.0112
01-311-4-LW	0.100000	0.000000	0.0000
01-311-6-L	0.100000	0.000640	0.0064
01-312-2-Q	1.000000	0.011214	0.0112
01-319-0-C	0.100000	0.010042	0.1004
02-100-1-LL	0.100000	0.007995	0.0799
02-100-2-L	0.100000	0.005662	0.0566
02-100-3-TS	0.100000	0.000000	0.0000
02-100-4-L	0.100000	0.005541	0.0554
02-100-5-L	0.100000	0.003231	0.0323
02-113-2-LW	0.100000	0.000000	0.0000
02-115-1-LP	0.100000	0.002281	0.0228
02-116-1-LW	0.100000	0.000000	0.0000
02-120-2-L	0.100000	0.010206	0.1021
02-120-4-LW	0.100000	0.000000	0.0000
02-120-6-L	0.100000	0.004604	0.0460
02-121-2-LP	0.100000	0.004024	0.0402
02-122-1-LW	0.100000	0.000000	0.0000
02-122-3-L	0.100000	0.002531	0.0253
02-129-1-Q	1.000000	0.006175	0.0062
02-132-2-LW	0.100000	0.000000	0.0000
02-136-1-LW	0.100000	0.000000	0.0000
02-136-2-LW	0.100000	0.000000	0.0000
02-136-3-L	0.100000	0.003352	0.0335

02-136-4-L	0.100000	0.007195	0.0720
02-138-1-T	1.000000	0.000000	0.0000
02-145-1-A	0.330000	0.002456	0.0074
02-145-2-TS	0.100000	0.000000	0.0000
02-146-1-L	0.100000	0.002297	0.0230
02-148-2-L	0.100000	0.004422	0.0442
02-152-2-LW	0.100000	0.000000	0.0000
02-154-1-LW	0.100000	0.000000	0.0000
02-158-2-A	1.000000	0.004352	0.0044
02-162-1-TS	0.100000	0.000000	0.0000
02-162-2-A	0.330000	0.003860	0.0117
02-162-3-L	0.100000	0.002544	0.0254
02-162-4-LW	0.100000	0.000000	0.0000
02-162-6-L	0.100000	0.004205	0.0421
02-171-1-LW	0.100000	0.000000	0.0000
02-178-0-E	0.033000	0.020400	0.6182
02-178-1-LP	0.100000	0.000447	0.0045
02-218-0-QO	0.330000	0.004354	0.0132
03-105-0-Q	0.100000	0.002571	0.0257
03-105-1-A	0.100000	0.003619	0.0362
03-106-2-A	0.100000	0.003289	0.0329
03-111-2-LP	0.100000	0.001186	0.0119
03-117-2-LW	0.100000	0.000000	0.0000
03-129-1-TS	0.100000	0.000000	0.0000
03-132-2-A	1.000000	0.001776	0.0018
03-140-1-LP	0.100000	0.000633	0.0063
03-145-2-TS	0.100000	0.000000	0.0000
03-147-1-A	0.100000	0.000964	0.0096
03-154-1-Q	0.330000	0.002043	0.0062
03-157-1-A	0.330000	0.000964	0.0029
03-157-2-A	1.000000	0.001791	0.0018
03-162-1-A	1.000000	0.001096	0.0011
03-162-2-Q	0.100000	0.000000	0.0000
03-162-3-Q	0.100000	0.000000	0.0000
03-165-1-TS	0.100000	0.000000	0.0000
03-178-2-E	0.033000	0.014280	0.4327
03-218-0-Q	0.100000	0.000320	0.0032
04-108-0-C	0.033000	0.001262	0.0382
04-126-0-Q	0.033000	0.001434	0.0435
04-126-2-LW	0.100000	0.000000	0.0000
04-126-4-A	1.000000	0.001584	0.0016
04-132-2-L	0.100000	0.001241	0.0124
1-028-0-K	0.033000	0.001500	0.0455
1-100-0-LP	0.100000	0.000005	0.0001
1-100-1-TS	0.100000	0.000000	0.0000
1-100-2-LP	0.100000	0.000000	0.0000
1-100-3-LP	0.100000	0.000005	0.0001
1-100-5-LL	0.100000	0.019157	0.1916
1-100-6-Q	1.000000	0.012787	0.0128
1-105-0-Q	0.100000	0.003574	0.0357
1-119-1-Q	0.100000	0.000000	0.0000
1-124-2-LL	0.100000	0.010955	0.1095
1-132-1-Q	0.100000	0.002640	0.0264
1-138-1-T	1.000000	0.000000	0.0000
1-145-1-T	1.000000	0.000000	0.0000
1-145-2-TS	0.100000	0.000000	0.0000

1-154-1-A	0.330000	0.000630	0.0019
1-162-1-TS	0.100000	0.000000	0.0000
1-162-2-LP	0.100000	0.002300	0.0230
1-162-3-LP	0.100000	0.003546	0.0355
1-162-4-Q	1.000000	0.002860	0.0029
1-162-5-LW	0.100000	0.000000	0.0000
1-162-6-A	0.330000	0.002496	0.0076
1-162-7-L	0.100000	0.010507	0.1051
1-169-2-T	1.000000	0.000000	0.0000
1-174-1-L	0.330000	0.007920	0.0240
1-174-3-L	0.100000	0.006222	0.0622
1-178-1-E	0.033000	0.045200	1.3697
1-178-2-E	0.033000	0.045200	1.3697
1-178-4-QO	1.000000	0.002703	0.0027
1-178-6-QO	1.000000	0.004543	0.0045
1-187-2-QO	1.000000	0.004784	0.0048
1-198-2-QO	1.000000	0.005465	0.0055
1-199-1-L	0.330000	0.005795	0.0176
1-199-3-L	0.330000	0.006767	0.0205
1-206-2-QO	1.000000	0.004624	0.0046
1-207-1-A	0.100000	0.006648	0.0665
1-207-2-LP	0.100000	0.003571	0.0357
1-207-3-A	1.000000	0.006317	0.0063
1-207-5-A	1.000000	0.009949	0.0099
1-210-0-M	0.330000	0.003118	0.0094
1-210-1-Q	1.000000	0.007932	0.0079
1-210-2-Q	1.000000	0.000320	0.0003
1-210-3-A	1.000000	0.004046	0.0040
1-213-2-TS	0.100000	0.000000	0.0000
1-217-2-A	1.000000	0.000980	0.0010
1-218-2-A	1.000000	0.001115	0.0011
1-22-0-Q	0.100000	0.000000	0.0000
1-223-0-C	1.000000	0.007357	0.0074
1-223-2-LP	0.100000	0.003956	0.0396
1-223-4-A	1.000000	0.004523	0.0045
1-233-2-A	0.330000	0.006810	0.0206
1-239-0-Q	0.100000	0.006450	0.0645
1-239-1-LP	0.100000	0.001328	0.0133
1-239-2-A	1.000000	0.004763	0.0048
1-245-1-Q	0.100000	0.000000	0.0000
1-255-0-Q	0.100000	0.005100	0.0510
1-255-2-TS	0.100000	0.000000	0.0000
1-271-0-Q	0.100000	0.007542	0.0754
1-271-2-Q	0.330000	0.003970	0.0120
1-278-2-TS	0.100000	0.000000	0.0000
1-287-2-Q	0.100000	0.004466	0.0447
1-295-1-Q	0.100000	0.000000	0.0000
1-302-2-LW	0.100000	0.000000	0.0000
1-307-2-A	1.000000	0.006401	0.0064
1-311-2-T	1.000000	0.000000	0.0000
1-319-0-LP	0.100000	0.001521	0.0152
1-344-0-K	0.033000	0.001500	0.0455
1-4-0-A	0.330000	0.002109	0.0064
1-4-2-Q	0.100000	0.002377	0.0238
1-49-0-Q	0.330000	0.000000	0.0000
1-49-1-LP	0.100000	0.000005	0.0001

1-49-2-LP	0.100000	0.000797	0.0080
1-49-4-A	0.330000	0.000945	0.0029
1-49-5-Q	0.100000	0.000000	0.0000
1-52-0-LP	0.100000	0.000005	0.0001
1-64-2-A	0.100000	0.002256	0.0226
1-89-2-QO	1.000000	0.001403	0.0014
1-89-4-A	0.330000	0.001637	0.0050
2-100-0-LP	0.100000	0.005736	0.0574
2-100-1-L	0.100000	0.016301	0.1630
2-100-2-L	0.100000	0.008815	0.0882
2-100-3-A	1.000000	0.008932	0.0089
2-100-4-L	0.100000	0.006301	0.0630
2-100-5-A	1.000000	0.005107	0.0051
2-100-7-LL	0.100000	0.016754	0.1675
2-105-1-TS	0.100000	0.000000	0.0000
2-111-1-LW	0.100000	0.000000	0.0000
2-111-2-LW	0.100000	0.000000	0.0000
2-121-1-LW	0.100000	0.000000	0.0000
2-121-2-LW	0.100000	0.000000	0.0000
2-121-3-L	0.100000	0.008816	0.0882
2-121-4-L	0.100000	0.006171	0.0617
2-125-2-LW	0.100000	0.000000	0.0000
2-130-2-QO	1.000000	0.009671	0.0097
2-134-1-LL	0.100000	0.012819	0.1282
2-145-1-T	1.000000	0.000000	0.0000
2-145-2-TS	0.100000	0.000000	0.0000
2-146-2-Q	1.000000	0.012589	0.0126
2-148-1-Q	1.000000	0.005078	0.0051
2-148-3-Q	1.000000	0.008623	0.0086
2-154-1-A	0.330000	0.005217	0.0158
2-157-2-A	1.000000	0.005880	0.0059
2-162-1-TS	0.100000	0.000000	0.0000
2-162-2-LP	0.100000	0.000590	0.0059
2-162-3-LP	0.100000	0.002401	0.0240
2-162-4-Q	1.000000	0.002669	0.0027
2-162-5-Q	0.330000	0.003150	0.0095
2-169-2-T	1.000000	0.000000	0.0000
2-178-1-E	0.033000	0.045200	1.3697
2-178-2-E	0.033000	0.045200	1.3697
2-180-1-Q	0.330000	0.003321	0.0101
2-195-1-A	0.100000	0.006647	0.0665
2-195-2-Q	0.100000	0.000770	0.0077
2-205-1-Q	1.000000	0.004796	0.0048
2-210-0-Q	0.100000	0.002694	0.0269
2-210-01-Q	0.100000	0.004136	0.0414
2-210-2-TS	0.100000	0.000000	0.0000
2-22-0-A	0.330000	0.000630	0.0019
2-223-0-C	0.033000	0.002243	0.0680
2-223-1-LP	0.100000	0.000226	0.0023
2-223-2-LP	0.100000	0.000430	0.0043
2-223-3-Q	0.033000	0.001164	0.0353
2-223-4-Q	0.033000	0.001381	0.0418
2-251-2-A	1.000000	0.001529	0.0015
2-256-1-TS	0.100000	0.000000	0.0000
2-256-2-TS	0.100000	0.000000	0.0000
2-262-1-Q	0.100000	0.001136	0.0114

2-262-2-QF	0.100000	0.000000	0.0000
2-271-1-L	0.100000	0.005477	0.0548
2-271-2-L	0.100000	0.005989	0.0599
2-271-3-LP	0.100000	0.001181	0.0118
2-271-4-LP	0.100000	0.001172	0.0117
2-271-5-L	0.100000	0.001961	0.0196
2-271-6-L	0.100000	0.002491	0.0249
2-275-2-TS	0.100000	0.000000	0.0000
2-279-1-TS	0.100000	0.000000	0.0000
2-281-1-LW	0.100000	0.000000	0.0000
2-281-2-LW	0.100000	0.000000	0.0000
2-284-1-LW	0.100000	0.000000	0.0000
2-284-2-LW	0.100000	0.000000	0.0000
2-291-1-LW	0.100000	0.000000	0.0000
2-291-2-LW	0.100000	0.000000	0.0000
2-291-3-L	0.100000	0.005008	0.0501
2-291-4-L	0.100000	0.004984	0.0498
2-295-1-LW	0.100000	0.000000	0.0000
2-295-2-L	0.100000	0.001961	0.0196
2-295-3-L	0.100000	0.001690	0.0169
2-295-4-LW	0.100000	0.000000	0.0000
2-311-0-Q	0.100000	0.000000	0.0000
2-311-2-T	1.000000	0.000000	0.0000
2-343-0-A	0.330000	0.000630	0.0019
2-343-2-A	1.000000	0.001187	0.0012
2-343-3-C	0.330000	0.001346	0.0041
2-361-1-E	0.033000	0.006862	0.2079
2-361-2-E	0.033000	0.006862	0.2079
2-388-1-A	0.330000	0.000630	0.0019
2-388-2-A	0.330000	0.000630	0.0019
2-4-0-A	0.330000	0.000652	0.0020
2-49-0-AA	0.100000	0.000630	0.0063
2-49-1-A	1.000000	0.000742	0.0007
2-61-1-M	0.330000	0.000095	0.0003
2-65-1-Q	0.330000	0.000765	0.0023
2-65-2-C	0.330000	0.000960	0.0029
2-95-2-Q	0.100000	0.000840	0.0084
3-100-0-E	0.033000	0.047400	1.4364
3-162-0-E	0.033000	0.047400	1.4364
3-22-0-A	0.330000	0.000630	0.0019
3-223-0-E	0.033000	0.003100	0.0939
3-271-0-E	0.100000	0.010039	0.1004
3-311-0-AA	0.100000	0.000630	0.0063
3-311-2-T	1.000000	0.000000	0.0000
3-4-0-A	0.330000	0.000630	0.0019
3-49-0-AA	0.100000	0.000630	0.0063
4-100-0-E	0.033000	0.047400	1.4364
4-162-0-E	0.033000	0.047400	1.4364
4-223-0-E	0.033000	0.003100	0.0939
4-271-0-E	0.033000	0.002000	0.0606
4-49-0-E	0.033000	0.002000	0.0606
5-100-0-E	0.033000	0.047400	1.4364
5-162-0-E	0.033000	0.047400	1.4364
5-223-0-E	0.033000	0.003100	0.0939
5-49-0-E	0.100000	0.003300	0.0330
5-76-0-E	0.100000	0.003300	0.0330

APPENDIX L4

Options in effect for information below include:

All doors except accomodation doors closed
A WORST CASE scenario
Passive and Automated Fire Protection only
Simulation ran for 40 minutes

Target room	Unacceptable Loss Freq	Rel Freq of Failure/FFS	Fraction of Unacceptable Loss Freq
01-100-0-LL	0.100000	0.007541	0.0754
01-100-1-TS	0.100000	0.000000	0.0000
01-100-2-LP	0.100000	0.003823	0.0382
01-100-3-L	0.100000	0.002534	0.0253
01-100-4-L	0.100000	0.002161	0.0216
01-106-2-LW	0.100000	0.000000	0.0000
01-111-1-LW	0.100000	0.000000	0.0000
01-113-2-L	0.100000	0.002501	0.0250
01-114-1-LP	0.100000	0.002844	0.0284
01-117-2-LW	0.100000	0.000000	0.0000
01-118-1-LW	0.100000	0.000000	0.0000
01-118-3-L	0.100000	0.002469	0.0247
01-125-2-LW	0.100000	0.000000	0.0000
01-125-4-L	0.100000	0.002696	0.0270
01-126-1-Q	1.000000	0.002529	0.0025
01-132-1-LW	0.100000	0.000000	0.0000
01-132-3-L	0.100000	0.002217	0.0222
01-138-1-T	1.000000	0.000000	0.0000
01-142-2-L	0.100000	0.002998	0.0300
01-145-2-TS	0.100000	0.000000	0.0000
01-146-1-LW	0.100000	0.000000	0.0000
01-146-3-L	1.000000	0.003047	0.0030
01-153-1-A	0.330000	0.002909	0.0088
01-154-2-LW	0.100000	0.000000	0.0000
01-162-1-TS	0.100000	0.000000	0.0000
01-162-2-LP	0.100000	0.000142	0.0014
01-162-3-LP	0.100000	0.000005	0.0001
01-162-4-LW	0.100000	0.000000	0.0000
01-162-5-A	1.000000	0.000855	0.0009
01-162-6-L	0.100000	0.000685	0.0068
01-178-1-LP	0.100000	0.000640	0.0064
01-218-1-LW	0.100000	0.000000	0.0000
01-218-2-LW	0.100000	0.000000	0.0000
01-218-3-A	1.000000	0.008964	0.0090
01-218-4-A	1.000000	0.004094	0.0041
01-218-5-LP	0.100000	0.004781	0.0478
01-218-6-LP	0.100000	0.002919	0.0292
01-218-8-A	0.330000	0.001462	0.0044
01-222-0-LW	0.100000	0.000000	0.0000
01-222-1-L	0.100000	0.006230	0.0623

01-222-2-L	0.100000	0.004622	0.0462
01-225-0-L	0.100000	0.005301	0.0530
01-239-1-LW	0.100000	0.000000	0.0000
01-239-2-LW	0.100000	0.000000	0.0000
01-239-3-L	0.100000	0.005121	0.0512
01-239-4-L	0.100000	0.004402	0.0440
01-239-6-LP	0.100000	0.000869	0.0087
01-239-8-A	0.330000	0.000000	0.0000
01-255-0-L	0.100000	0.005489	0.0549
01-255-1-LW	0.100000	0.000000	0.0000
01-255-10-A	0.330000	0.000630	0.0019
01-255-2-L	0.100000	0.004938	0.0494
01-255-3-L	0.100000	0.004540	0.0454
01-255-4-LW	0.100000	0.000000	0.0000
01-255-5-LW	0.100000	0.000000	0.0000
01-255-6-LP	0.100000	0.001249	0.0125
01-255-8-A	1.000000	0.001633	0.0016
01-261-2-TS	0.100000	0.000000	0.0000
01-271-1-L	0.100000	0.010210	0.1021
01-271-2-Q	1.000000	0.010295	0.0103
01-271-4-L	0.100000	0.001461	0.0146
01-271-6-LW	0.100000	0.000000	0.0000
01-271-8-L	0.100000	0.003302	0.0330
01-277-1-LW	0.100000	0.000000	0.0000
01-277-3-LW	0.100000	0.000000	0.0000
01-277-5-L	0.100000	0.007802	0.0780
01-278-2-LW	0.100000	0.000000	0.0000
01-292-2-LP	0.100000	0.004175	0.0418
01-292-4-L	0.100000	0.005017	0.0502
01-292-6-LW	0.100000	0.000000	0.0000
01-292-8-L	0.100000	0.004478	0.0448
01-298-2-LW	0.100000	0.000000	0.0000
01-311-2-Q	1.000000	0.010947	0.0109
01-311-4-LW	0.100000	0.000000	0.0000
01-311-6-L	0.100000	0.000640	0.0064
01-319-2-Q	1.000000	0.010947	0.0109
01-319-0-C	0.100000	0.007717	0.0772
02-100-1-LL	0.100000	0.007995	0.0799
02-100-2-L	0.100000	0.005662	0.0566
02-100-3-TS	0.100000	0.000000	0.0000
02-100-4-L	0.100000	0.005541	0.0554
02-100-5-L	0.100000	0.003231	0.0323
02-113-2-LW	0.100000	0.000000	0.0000
02-115-1-LP	0.100000	0.002281	0.0228
02-116-1-LW	0.100000	0.000000	0.0000
02-120-2-L	0.100000	0.010206	0.1021
02-120-4-LW	0.100000	0.000000	0.0000
02-120-6-L	0.100000	0.004604	0.0460
02-121-2-LP	0.100000	0.004024	0.0402
02-122-1-LW	0.100000	0.000000	0.0000
02-122-3-L	0.100000	0.002531	0.0253
02-129-1-Q	1.000000	0.006177	0.0062
02-132-2-LW	0.100000	0.000000	0.0000
02-136-1-LW	0.100000	0.000000	0.0000
02-136-2-LW	0.100000	0.000000	0.0000
02-136-3-L	0.100000	0.003352	0.0335

02-136-4-L	0.100000	0.007181	0.0718
02-138-1-T	1.000000	0.000000	0.0000
02-145-1-A	0.330000	0.002456	0.0074
02-145-2-TS	0.100000	0.000000	0.0000
02-146-1-L	0.100000	0.002297	0.0230
02-148-2-L	0.100000	0.004411	0.0441
02-152-2-LW	0.100000	0.000000	0.0000
02-154-1-LW	0.100000	0.000000	0.0000
02-158-2-A	1.000000	0.004352	0.0044
02-162-1-TS	0.100000	0.000000	0.0000
02-162-2-A	0.330000	0.003860	0.0117
02-162-3-L	0.100000	0.002544	0.0254
02-162-4-LW	0.100000	0.000000	0.0000
02-162-6-L	0.100000	0.004205	0.0421
02-171-1-LW	0.100000	0.000000	0.0000
02-178-0-E	0.033000	0.003060	0.0927
02-178-1-LP	0.100000	0.000354	0.0035
02-218-0-QO	0.330000	0.002137	0.0065
03-105-0-Q	0.100000	0.001452	0.0145
03-105-1-A	0.100000	0.002570	0.0257
03-106-2-A	0.100000	0.001551	0.0155
03-111-2-LP	0.100000	0.000105	0.0011
03-117-2-LW	0.100000	0.000000	0.0000
03-129-1-TS	0.100000	0.000000	0.0000
03-132-2-A	1.000000	0.000827	0.0008
03-140-1-LP	0.100000	0.000297	0.0030
03-145-2-TS	0.100000	0.000000	0.0000
03-147-1-A	0.100000	0.000630	0.0063
03-154-1-Q	0.330000	0.000960	0.0029
03-157-1-A	0.330000	0.000809	0.0025
03-157-2-A	1.000000	0.000720	0.0007
03-162-1-A	1.000000	0.000922	0.0009
03-162-2-Q	0.100000	0.000000	0.0000
03-162-3-Q	0.100000	0.000000	0.0000
03-165-1-TS	0.100000	0.000000	0.0000
03-178-2-E	0.033000	0.002142	0.0649
03-218-0-Q	0.100000	0.000320	0.0032
04-108-0-C	0.033000	0.001181	0.0358
04-126-0-Q	0.033000	0.001431	0.0435
04-126-2-LW	0.100000	0.000000	0.0000
04-126-4-A	1.000000	0.001579	0.0016
04-132-2-L	0.100000	0.001230	0.0123
1-028-0-K	0.033000	0.001500	0.0455
1-100-0-LP	0.100000	0.000005	0.0001
1-100-1-TS	0.100000	0.000000	0.0000
1-100-2-LP	0.100000	0.000000	0.0000
1-100-3-LP	0.100000	0.000005	0.0001
1-100-5-LL	0.100000	0.006823	0.0682
1-100-6-Q	1.000000	0.006441	0.0064
1-105-0-Q	0.100000	0.003241	0.0324
1-119-1-Q	0.100000	0.000000	0.0000
1-124-2-LL	0.100000	0.006041	0.0604
1-132-1-Q	0.100000	0.000528	0.0053
1-138-1-T	1.000000	0.000000	0.0000
1-145-1-T	1.000000	0.000000	0.0000
1-145-2-TS	0.100000	0.000000	0.0000

1-154-1-A	0.330000	0.000630	0.0019
1-162-1-TS	0.100000	0.000000	0.0000
1-162-2-LP	0.100000	0.002300	0.0230
1-162-3-LP	0.100000	0.003527	0.0353
1-162-4-Q	1.000000	0.002860	0.0029
1-162-5-LW	0.100000	0.000000	0.0000
1-162-6-A	0.330000	0.002496	0.0076
1-162-7-L	0.100000	0.010116	0.1012
1-169-2-T	1.000000	0.000000	0.0000
1-174-1-L	0.330000	0.007891	0.0239
1-174-3-L	0.100000	0.006030	0.0603
1-178-1-E	0.033000	0.009040	0.2739
1-178-2-E	0.033000	0.009040	0.2739
1-178-4-QO	1.000000	0.002703	0.0027
1-178-6-QO	1.000000	0.004543	0.0045
1-187-2-QO	1.000000	0.004784	0.0048
1-198-2-QO	1.000000	0.005313	0.0053
1-199-1-L	0.330000	0.005779	0.0175
1-199-3-L	0.330000	0.006729	0.0204
1-206-2-QO	1.000000	0.004624	0.0046
1-207-1-A	0.100000	0.006296	0.0630
1-207-2-LP	0.100000	0.003493	0.0349
1-207-3-A	1.000000	0.006302	0.0063
1-207-5-A	1.000000	0.009669	0.0097
1-210-0-M	0.330000	0.001673	0.0051
1-210-1-Q	1.000000	0.003155	0.0032
1-210-2-Q	1.000000	0.000320	0.0003
1-210-3-A	1.000000	0.003704	0.0037
1-213-2-TS	0.100000	0.000000	0.0000
1-217-2-A	1.000000	0.000810	0.0008
[illegible]	[illegible]	[illegible]	0.0011
[illegible]	[illegible]	0.000000	0.0000
1-223-0-C	1.000000	0.004483	0.0045
1-223-2-LP	0.100000	0.003215	0.0321
1-223-4-A	1.000000	0.003805	0.0038
1-233-2-A	0.330000	0.004083	0.0124
1-239-0-Q	0.100000	0.004964	0.0496
1-239-1-LP	0.100000	0.000600	0.0060
1-239-2-A	1.000000	0.004071	0.0041
1-245-1-Q	0.100000	0.000000	0.0000
1-255-0-Q	0.100000	0.004641	0.0464
1-255-2-TS	0.100000	0.000000	0.0000
1-271-0-Q	0.100000	0.002095	0.0210
1-271-2-Q	0.330000	0.003249	0.0098
1-278-2-TS	0.100000	0.000000	0.0000
1-287-2-Q	0.100000	0.004212	0.0421
1-295-1-Q	0.100000	0.000000	0.0000
1-302-2-LW	0.100000	0.000000	0.0000
1-307-2-A	1.000000	0.003954	0.0040
1-311-2-T	1.000000	0.000000	0.0000
1-319-0-LP	0.100000	0.000146	0.0015
1-344-0-K	0.033000	0.001500	0.0455
1-4-0-A	0.330000	0.002109	0.0064
1-4-2-Q	0.100000	0.002377	0.0238
1-49-0-Q	0.330000	0.000000	0.0000
1-49-1-LP	0.100000	0.000005	0.0001

1-49-2-LP	0.100000	0.000108	0.0011
1-49-4-A	0.330000	0.000658	0.0020
1-49-5-Q	0.100000	0.000000	0.0000
1-52-0-LP	0.100000	0.000005	0.0001
1-64-2-A	0.100000	0.001419	0.0142
1-89-2-QO	1.000000	0.001391	0.0014
1-89-4-A	0.330000	0.001177	0.0036
2-100-0-LP	0.100000	0.005630	0.0563
2-100-1-L	0.100000	0.006474	0.0647
2-100-2-L	0.100000	0.005648	0.0565
2-100-3-A	1.000000	0.008210	0.0082
2-100-4-L	0.100000	0.005718	0.0572
2-100-5-A	1.000000	0.005025	0.0050
2-100-7-LL	0.100000	0.003644	0.0364
2-105-1-TS	0.100000	0.000000	0.0000
2-111-1-LW	0.100000	0.000000	0.0000
2-111-2-LW	0.100000	0.000000	0.0000
2-121-1-LW	0.100000	0.000000	0.0000
2-121-2-LW	0.100000	0.000000	0.0000
2-121-3-L	0.100000	0.005733	0.0573
2-121-4-L	0.100000	0.005439	0.0544
2-125-2-LW	0.100000	0.000000	0.0000
2-130-2-QO	1.000000	0.005022	0.0050
2-134-1-LL	0.100000	0.008760	0.0876
2-145-1-T	1.000000	0.000000	0.0000
2-145-2-TS	0.100000	0.000000	0.0000
2-146-2-Q	1.000000	0.005065	0.0051
2-148-1-Q	1.000000	0.004974	0.0050
2-148-3-Q	1.000000	0.008143	0.0081
2-154-1-A	0.330000	0.004575	0.0139
2-157-2-A	1.000000	0.005158	0.0052
2-162-1-TS	0.100000	0.000000	0.0000
2-162-2-LP	0.100000	0.000353	0.0035
2-162-3-LP	0.100000	0.002009	0.0201
2-162-4-Q	1.000000	0.002438	0.0024
2-162-5-Q	0.330000	0.002607	0.0079
2-169-2-T	1.000000	0.000000	0.0000
2-178-1-E	0.033000	0.009040	0.2739
2-178-2-E	0.033000	0.009040	0.2739
2-180-1-Q	0.330000	0.002609	0.0079
2-195-1-A	0.100000	0.004843	0.0484
2-195-2-Q	0.100000	0.000770	0.0077
2-205-1-Q	1.000000	0.003058	0.0031
2-210-0-Q	0.100000	0.001814	0.0181
2-210-01-Q	0.100000	0.002021	0.0202
2-210-2-TS	0.100000	0.000000	0.0000
2-22-0-A	0.330000	0.000189	0.0006
2-223-0-C	0.033000	0.001983	0.0601
2-223-1-LP	0.100000	0.000017	0.0002
2-223-2-LP	0.100000	0.000226	0.0023
2-223-3-Q	0.033000	0.001164	0.0353
2-223-4-Q	0.033000	0.001164	0.0353
2-231-2-A	1.000000	0.001178	0.0012
2-258-1-TS	0.100000	0.000000	0.0000
2-258-2-TS	0.100000	0.000000	0.0000
2-262-1-Q	0.100000	0.001123	0.0113

2-262-2-QF	0.100000	0.000000	0.0000
2-271-1-L	0.100000	0.004029	0.0403
2-271-2-L	0.100000	0.004493	0.0449
2-271-3-LP	0.100000	0.001181	0.0118
2-271-4-LP	0.100000	0.001172	0.0117
2-271-5-L	0.100000	0.001961	0.0196
2-271-6-L	0.100000	0.002423	0.0242
2-275-2-TS	0.100000	0.000000	0.0000
2-279-1-TS	0.100000	0.000000	0.0000
2-281-1-LW	0.100000	0.000000	0.0000
2-281-2-LW	0.100000	0.000000	0.0000
2-284-1-LW	0.100000	0.000000	0.0000
2-284-2-LW	0.100000	0.000000	0.0000
2-291-1-LW	0.100000	0.000000	0.0000
2-291-2-LW	0.100000	0.000000	0.0000
2-291-3-L	0.100000	0.004682	0.0468
2-291-4-L	0.100000	0.004331	0.0433
2-295-1-LW	0.100000	0.000000	0.0000
2-295-2-L	0.100000	0.001961	0.0196
2-295-3-L	0.100000	0.001690	0.0169
2-295-4-LW	0.100000	0.000000	0.0000
2-311-0-Q	0.100000	0.000000	0.0000
2-311-2-T	1.000000	0.000000	0.0000
2-343-0-A	0.330000	0.000630	0.0019
2-343-2-A	1.000000	0.000861	0.0009
2-343-3-C	0.330000	0.001008	0.0031
2-361-1-E	0.033000	0.006249	0.1894
2-361-2-E	0.033000	0.006249	0.1894
2-388-1-A	0.330000	0.000630	0.0019
2-388-2-A	0.330000	0.000630	0.0019
2-4-0-A	0.330000	0.000630	0.0019
2-49-0-AA	0.100000	0.000189	0.0019
2-49-1-A	1.000000	0.000720	0.0007
2-61-1-M	0.330000	0.000010	0.0000
2-65-1-Q	0.330000	0.000765	0.0023
2-65-2-C	0.330000	0.000960	0.0029
2-95-2-Q	0.100000	0.000840	0.0084
3-100-0-E	0.033000	0.007110	0.2155
3-162-0-E	0.033000	0.007110	0.2155
3-22-0-A	0.330000	0.000189	0.0006
3-223-0-E	0.033000	0.002604	0.0789
3-271-0-E	0.100000	0.000637	0.0064
3-311-0-AA	0.100000	0.000189	0.0019
3-311-2-T	1.000000	0.000000	0.0000
3-4-0-A	0.330000	0.000126	0.0004
3-49-0-AA	0.100000	0.000189	0.0019
4-100-0-E	0.033000	0.007110	0.2155
4-162-0-E	0.033000	0.007110	0.2155
4-223-0-E	0.033000	0.002604	0.0789
4-271-0-E	0.033000	0.001660	0.0503
4-49-0-E	0.033000	0.002000	0.0606
5-100-0-E	0.033000	0.007110	0.2155
5-162-0-E	0.033000	0.007110	0.2155
5-223-0-E	0.033000	0.002604	0.0789
5-49-0-E	0.100000	0.003300	0.0330
5-76-0-E	0.100000	0.003300	0.0330

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APPENDIX L5

Options in effect for information below include:

All doors except accomodation space doors closed
A WORST CASE scenario
Passive, Automatic and Manual Fire Protection
Simulation ran for 40 minutes

Target room	Unacceptable Loss Freq	Rel Freq of Failure|FFS	Fraction of Unacceptable Loss Freq
01-100-0-LL	0.100000	0.003954	0.0395
01-100-1-TS	0.100000	0.000000	0.0000
01-100-2-LP	0.100000	0.001829	0.0183
01-100-3-L	0.100000	0.001137	0.0114
01-100-4-L	0.100000	0.000994	0.0099
01-106-2-LW	0.100000	0.000000	0.0000
01-111-1-LW	0.100000	0.000000	0.0000
01-113-2-L	0.100000	0.001154	0.0115
01-114-1-LP	0.100000	0.001472	0.0147
01-117-2-LW	0.100000	0.000000	0.0000
01-118-1-LW	0.100000	0.000000	0.0000
01-118-3-L	0.100000	0.001235	0.0123
01-125-2-LW	0.100000	0.000000	0.0000
01-125-4-L	0.100000	0.001079	0.0108
01-126-1-Q	1.000000	0.001162	0.0012
01-132-1-LW	0.100000	0.000000	0.0000
01-132-3-L	0.100000	0.001261	0.0126
01-138-1-T	1.000000	0.000000	0.0000
01-142-2-L	0.100000	0.001185	0.0119
01-145-2-TS	0.100000	0.000000	0.0000
01-146-1-LW	0.100000	0.000000	0.0000
01-146-3-L	1.000000	0.001201	0.0012
01-153-1-A	0.330000	0.001388	0.0042
01-154-2-LW	0.100000	0.000000	0.0000
01-162-1-TS	0.100000	0.000000	0.0000
01-162-2-LP	0.100000	0.000042	0.0004
01-162-3-LP	0.100000	0.000003	0.0000
01-162-4-LW	0.100000	0.000000	0.0000
01-162-5-A	1.000000	0.000513	0.0005
01-162-6-L	0.100000	0.000478	0.0048
01-178-1-LP	0.100000	0.000168	0.0017
01-218-1-LW	0.100000	0.000000	0.0000
01-218-2-LW	0.100000	0.000000	0.0000
01-218-3-A	1.000000	0.003508	0.0035
01-218-4-A	1.000000	0.001524	0.0015
01-218-5-LP	0.100000	0.002579	0.0258
01-218-6-LP	0.100000	0.001281	0.0128
01-218-8-A	0.330000	0.000829	0.0025
01-222-0-LW	0.100000	0.000000	0.0000
01-222-1-L	0.100000	0.002942	0.0294

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01-222-2-L	0.100000	0.001463	0.0146
01-225-0-L	0.100000	0.002302	0.0230
01-239-1-LW	0.100000	0.000000	0.0000
01-239-2-LW	0.100000	0.000000	0.0000
01-239-3-L	0.100000	0.002569	0.0257
01-239-4-L	0.100000	0.001856	0.0186
01-239-6-LP	0.100000	0.000488	0.0049
01-239-8-A	0.330000	0.000000	0.0000
01-255-0-L	0.100000	0.002822	0.0282
01-255-1-LW	0.100000	0.000000	0.0000
01-255-10-A	0.330000	0.000441	0.0013
01-255-2-L	0.100000	0.002076	0.0208
01-255-3-L	0.100000	0.001783	0.0178
01-255-4-LW	0.100000	0.000000	0.0000
01-255-5-LW	0.100000	0.000000	0.0000
01-255-6-LP	0.100000	0.000809	0.0081
01-255-8-A	1.000000	0.000839	0.0008
01-261-2-TS	0.100000	0.000000	0.0000
01-271-1-L	0.100000	0.004560	0.0456
01-271-2-Q	1.000000	0.005276	0.0053
01-271-4-L	0.100000	0.000962	0.0096
01-271-6-LW	0.100000	0.000000	0.0000
01-271-8-L	0.100000	0.001496	0.0150
01-277-1-LW	0.100000	0.000000	0.0000
01-277-3-LW	0.100000	0.000000	0.0000
01-277-5-L	0.100000	0.003184	0.0318
01-278-2-LW	0.100000	0.000000	0.0000
01-292-2-LP	0.100000	0.001324	0.0132
01-292-4-L	0.100000	0.001647	0.0165
01-292-6-LW	0.100000	0.000000	0.0000
01-292-8-L	0.100000	0.001844	0.0184
01-298-2-LW	0.100000	0.000000	0.0000
01-311-2-Q	1.000000	0.004598	0.0046
01-311-4-LW	0.100000	0.000000	0.0000
01-311-6-L	0.100000	0.000448	0.0045
01-312-2-Q	1.000000	0.004870	0.0049
[illegible]19-0-C	0.100000	0.001740	0.0174
02-100-1-LL	0.100000	0.003443	0.0344
02-100-2-L	0.100000	0.002872	0.0287
02-100-3-TS	0.100000	0.000000	0.0000
02-100-4-L	0.100000	0.002556	0.0256
02-100-5-L	0.100000	0.001739	0.0174
02-113-2-LW	0.100000	0.000000	0.0000
02-115-1-LP	0.100000	0.001165	0.0116
02-116-1-LW	0.100000	0.000000	0.0000
02-120-2-L	0.100000	0.003771	0.0377
02-120-4-LW	0.100000	0.000000	0.0000
02-120-6-L	0.100000	0.002103	0.0210
02-121-2-LP	0.100000	0.001585	0.0159
02-122-1-LW	0.100000	0.000000	0.0000
02-122-3-L	0.100000	0.001362	0.0136
02-129-1-Q	1.000000	0.002215	0.0022
02-132-2-LW	0.100000	0.000000	0.0000
02-136-1-LW	0.100000	0.000000	0.0000
02-136-2-LW	0.100000	0.000000	0.0000
02-136-3-L	0.100000	0.001711	0.0171

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02-136-4-L	0.100000	0.002470	0.0247
02-138-1-T	1.000000	0.000000	0.0000
02-145-1-A	0.330000	0.001188	0.0036
02-145-2-TS	0.100000	0.000000	0.0000
02-146-1-L	0.100000	0.001289	0.0129
02-148-2-L	0.100000	0.001849	0.0185
02-152-2-LW	0.100000	0.000000	0.0000
02-154-1-LW	0.100000	0.000000	0.0000
02-158-2-A	1.000000	0.001446	0.0014
02-162-1-TS	0.100000	0.000000	0.0000
02-162-2-A	0.330000	0.001466	0.0044
02-162-3-L	0.100000	0.001413	0.0141
02-162-4-LW	0.100000	0.000000	0.0000
02-162-6-L	0.100000	0.001818	0.0182
02-171-1-LW	0.100000	0.000000	0.0000
02-178-0-E	0.033000	0.002754	0.0835
02-178-1-LP	0.100000	0.000049	0.0005
02-218-0-QO	0.330000	0.001026	0.0031
03-105-0-Q	0.100000	0.001266	0.0127
03-105-1-A	0.100000	0.002211	0.0221
03-106-2-A	0.100000	0.001395	0.0140
03-111-2-LP	0.100000	0.000035	0.0004
03-117-2-LW	0.100000	0.000000	0.0000
03-129-1-TS	0.100000	0.000000	0.0000
03-132-2-A	1.000000	0.000412	0.0004
03-140-1-LP	0.100000	0.000120	0.0012
03-145-2-TS	0.100000	0.000000	0.0000
03-147-1-A	0.100000	0.000441	0.0044
03-154-1-Q	0.330000	0.000768	0.0023
03-157-1-A	0.330000	0.000502	0.0015
03-157-2-A	1.000000	0.000432	0.0004
03-162-1-A	1.000000	0.000492	0.0005
03-162-2-Q	0.100000	0.000000	0.0000
03-162-3-Q	0.100000	0.000000	0.0000
03-165-1-TS	0.100000	0.000000	0.0000
03-178-2-E	0.033000	0.001928	0.0584
03-218-0-Q	0.100000	0.000128	0.0013
04-108-0-C	0.033000	0.000164	0.0050
04-126-0-Q	0.033000	0.000396	0.0120
04-126-2-LW	0.100000	0.000000	0.0000
04-126-4-A	1.000000	0.000760	0.0008
04-132-2-L	0.100000	0.000534	0.0053
1-028-0-K	0.033000	0.001500	0.0455
1-100-0-LP	0.100000	0.000003	0.0000
1-100-1-TS	0.100000	0.000000	0.0000
1-100-2-LP	0.100000	0.000000	0.0000
1-100-3-LP	0.100000	0.000003	0.0000
1-100-5-LL	0.100000	0.002115	0.0211
1-100-6-Q	1.000000	0.001415	0.0014
1-105-0-Q	0.100000	0.000809	0.0081
1-119-1-Q	0.100000	0.000000	0.0000
1-124-2-LL	0.100000	0.001626	0.0163
1-132-1-Q	0.100000	0.000475	0.0048
1-138-1-T	1.000000	0.000000	0.0000
1-145-1-T	1.000000	0.000000	0.0000
1-145-2-TS	0.100000	0.000000	0.0000

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1-154-1-A	0.330000	0.000441	0.0013
1-162-1-TS	0.100000	0.000000	0.0000
1-162-2-LP	0.100000	0.000239	0.0024
1-162-3-LP	0.100000	0.000620	0.0062
1-162-4-Q	1.000000	0.000911	0.0009
1-162-5-LW	0.100000	0.000000	0.0000
1-162-6-A	0.330000	0.000883	0.0027
1-162-7-L	0.100000	0.002514	0.0251
1-169-2-T	1.000000	0.000000	0.0000
1-174-1-L	0.330000	0.003032	0.0092
1-174-3-L	0.100000	0.001893	0.0189
1-178-1-E	0.033000	0.008136	0.2465
1-178-2-E	0.033000	0.008136	0.2465
1-178-4-QO	1.000000	0.000753	0.0008
1-178-6-QO	1.000000	0.000986	0.0016
1-187-2-QO	1.000000	0.000953	0.0010
1-198-2-QO	1.000000	0.000896	0.0009
1-199-1-L	0.330000	0.002429	0.0074
1-199-3-L	0.330000	0.002592	0.0079
1-206-2-QO	1.000000	0.000564	0.0006
1-207-1-A	0.100000	0.002252	0.0225
1-207-2-LP	0.100000	0.000522	0.0052
1-207-3-A	1.000000	0.002108	0.0021
1-207-5-A	1.000000	0.002878	0.0029
1-210-0-M	0.330000	0.000379	0.0011
1-210-1-Q	1.000000	0.000439	0.0004
1-210-2-Q	1.000000	0.000128	0.0001
1-210-3-A	1.000000	0.000862	0.0009
1-213-2-TS	0.100000	0.000000	0.0000
1-217-2-A	1.000000	0.000486	0.0005
1-218-2-A	1.000000	0.000573	0.0006
1-22-0-Q	0.100000	0.000000	0.0000
1-223-0-C	1.000000	0.000781	0.0008
1-223-2-LP	0.100000	0.000757	0.0076
1-223-4-A	1.000000	0.000980	0.0010
1-233-2-A	0.330000	0.001512	0.0046
1-239-0-Q	0.100000	0.002490	0.0249
1-239-1-LP	0.100000	0.000360	0.0036
1-239-2-A	1.000000	0.001770	0.0018
1-245-1-Q	0.100000	0.000000	0.0000
1-255-0-Q	0.100000	0.002465	0.0246
1-255-2-TS	0.100000	0.000000	0.0000
1-271-0-Q	0.100000	0.000902	0.0090
1-271-2-Q	0.330000	0.000771	0.0023
1-276-2-TS	0.100000	0.000000	0.0000
1-287-2-Q	0.100000	0.001176	0.0118
1-295-1-Q	0.100000	0.000000	0.0000
1-302-2-LW	0.100000	0.000000	0.0000
1-307-2-A	1.000000	0.001045	0.0010
1-311-0-T	1.000000	0.000000	0.0000
1-319-0-LP	0.100000	0.000044	0.0004
1-344-0-K	0.033000	0.001500	0.0455
1-4-0-A	0.330000	0.001045	0.0032
1-4-2-Q	0.100000	0.001635	0.0164
1-49-0-Q	0.330000	0.000000	0.0000
1-49-1-LP	0.100000	0.000003	0.0000

1-49-2-LP	0.100000	0.000018	0.0002
1-49-4-A	0.330000	0.000323	0.0010
1-49-5-Q	0.100000	0.000000	0.0000
1-52-0-LP	0.100000	0.000003	0.0000
1-64-2-A	0.100000	0.000521	0.0052
1-89-2-QO	1.000000	0.000514	0.0005
1-89-4-A	0.330000	0.000597	0.0018
2-100-0-LP	0.100000	0.001279	0.0123
2-100-1-L	0.100000	0.001667	0.0167
2-100-2-L	0.100000	0.001588	0.0159
2-100-3-A	1.000000	0.001924	0.0019
2-100-4-L	0.100000	0.001119	0.0112
2-100-5-A	1.000000	0.001203	0.0012
2-100-7-LL	0.100000	0.001389	0.0139
2-105-1-TS	0.100000	0.000000	0.0000
2-111-1-LW	0.100000	0.000000	0.0000
2-111-2-LW	0.100000	0.000000	0.0000
2-121-1-LW	0.100000	0.000000	0.0000
2-121-2-LW	0.100000	0.000000	0.0000
2-121-3-L	0.100000	0.001594	0.0159
2-121-4-L	0.100000	0.001561	0.0156
2-125-2-LW	0.100000	0.000000	0.0000
2-130-2-QO	1.000000	0.000989	0.0010
2-134-1-LL	0.100000	0.002024	0.0202
2-145-1-T	1.000000	0.000000	0.0000
2-145-2-TS	0.100000	0.000000	0.0000
2-146-2-Q	1.000000	0.000888	0.0009
2-148-1-Q	1.000000	0.001391	0.0014
2-148-3-Q	1.000000	0.001839	0.0018
2-154-1-A	0.330000	0.001174	0.0036
2-157-2-A	1.000000	0.001154	0.0012
2-162-1-TS	0.100000	0.000000	0.0000
2-162-2-LP	0.100000	0.000095	0.0010
2-162-3-LP	0.100000	0.000594	0.0059
2-162-4-Q	1.000000	0.001833	0.0018
2-162-5-Q	0.330000	0.001627	0.0049
2-169-2-T	1.000000	0.000000	0.0000
2-178-1-E	0.033000	0.008136	0.2465
2-178-2-E	0.033000	0.008136	0.2465
2-180-1-Q	0.330000	0.001633	0.0049
2-195-1-A	0.100000	0.003438	0.0344
2-195-2-Q	0.100000	0.000571	0.0057
2-205-1-Q	1.000000	0.001759	0.0018
2-210-0-Q	0.100000	0.000733	0.0073
2-210-01-Q	0.100000	0.000608	0.0061
2-210-2-TS	0.100000	0.000000	0.0000
2-22-0-A	0.330000	0.000113	0.0003
2-223-0-C	0.033000	0.001716	0.0520
2-223-1-LP	0.100000	0.000007	0.0001
2-223-2-LP	0.100000	0.000077	0.0008
2-223-3-Q	0.033000	0.001123	0.0340
2-223-4-Q	0.033000	0.001123	0.0340
2-251-2-A	1.000000	0.001133	0.0011
2-256-1-TS	0.100000	0.000000	0.0000
2-256-2-TS	0.100000	0.000000	0.0000
2-262-1-Q	0.100000	0.001094	0.0109

2-262-2-QF	0.100000	0.000000	0.0000
2-271-1-L	0.100000	0.001324	0.0132
2-271-2-L	0.100000	0.001329	0.0133
2-271-3-LP	0.100000	0.000279	0.0028
2-271-4-LP	0.100000	0.000268	0.0027
2-271-5-L	0.100000	0.000797	0.0080
2-271-6-L	0.100000	0.000843	0.0084
2-275-2-TS	0.100000	0.000000	0.0000
2-279-1-TS	0.100000	0.000000	0.0000
2-281-1-LW	0.100000	0.000000	0.0000
2-281-2-LW	0.100000	0.000000	0.0000
2-284-1-LW	0.100000	0.000000	0.0000
2-284-2-LW	0.100000	0.000000	0.0000
2-291-1-LW	0.100000	0.000000	0.0000
2-291-2-LW	0.100000	0.000000	0.0000
2-291-3-L	0.100000	0.001503	0.0150
2-291-4-L	0.100000	0.001346	0.0135
2-295-1-LW	0.100000	0.000000	0.0000
2-295-2-L	0.100000	0.000810	0.0081
2-295-3-L	0.100000	0.000783	0.0078
2-295-4-LW	0.100000	0.000000	0.0000
2-311-0-Q	0.100000	0.000000	0.0000
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2-343-2-A	1.000000	0.000511	0.0005
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2-361-1-E	0.033000	0.006208	0.1881
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2-388-1-A	0.330000	0.000441	0.0013
2-388-2-A	0.330000	0.000441	0.0013
2-4-0-A	0.330000	0.000315	0.0010
2-49-0-AA	0.100000	0.000113	0.0011
2-49-1-A	1.000000	0.000432	0.0004
2-61-1-M	0.330000	0.000010	0.0000
2-65-1-Q	0.330000	0.000536	0.0016
2-65-2-C	0.330000	0.000192	0.0006
2-95-2-Q	0.100000	0.000672	0.0067
3-100-0-E	0.033000	0.006399	0.1939
3-162-0-E	0.033000	0.006399	0.1939
3-22-0-A	0.330000	0.000113	0.0003
3-223-0-E	0.033000	0.002592	0.0785
3-271-0-E	0.100000	0.000454	0.0045
3-311-0-AA	0.100000	0.000113	0.0011
3-311-2-T	1.000000	0.000000	0.0000
3-4-0-A	0.330000	0.000088	0.0003
3-49-0-AA	0.100000	0.000113	0.0011
4-100-0-E	0.033000	0.006399	0.1939
4-162-0-E	0.033000	0.006399	0.1939
4-223-0-E	0.033000	0.002592	0.0785
4-271-0-E	0.033000	0.001654	0.0501
4-49-0-E	0.033000	0.001900	0.0576
5-100-0-E	0.033000	0.006399	0.1939
5-162-0-E	0.033000	0.006399	0.1939
5-223-0-E	0.033000	0.002592	0.0785
5-49-0-E	0.100000	0.003135	0.0313
5-76-0-E	0.100000	0.003135	0.0313

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APPENDIX M

Smoke Movement for PIR Project

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SMOKE MOVEMENT ANALYSIS

I. Introduction

II. The Building Research Institute (BRI) Fire Model

A. Two Room Burn
B. POLAR SEA Berthing Area Fire
C. VIGOROUS Ops Berthing Area Burn
D. POLAR SEA Paint Locker Burn
E. Two Level Burn Scenario
F. VIGOROUS Paint Locker Burn

III. Conclusions

SMOKE MOVEMENT ANALYSIS

I. Introduction

The smoke movement analysis was conducted using a modified version of the Building Research Institute Fire Model (computer model) to determine the extent of smoke movement from several simulated shipboard fires. Efforts concentrated on two separate ventilation systems by simulating established burning and determining the extent of smoke movement from these fires. A paint locker was selected as a heavy fuel load compartment and a berthing area was selected as an area with a probability of high loss of life during a fire. Simulations were run for fires in these locations and the data was compared with studies conducted aboard CGC VIGOROUS using SF_6 as a tracer gas. Simulations were then run on the POLAR SEA icebreaker where the data should be similar to the Polar Icebreaker Replacement (PIR) since the compartment configurations are similar.

THE BUILDING RESEARCH INSTITUTE (BRI) FIRE MODEL

The BRI model is a multi-level, multi-compartment deterministic fire spread model. Each compartment is divided into two major zones, a hot gas layer and a cold layer. The fire is modelled as a buoyant plume, whose behavior is described by algebraic equations largely based on empirical data from large-scale burns. The hot gas and ambient air entrained by the plume are carried from the fire into the upper layer which is always fully mixed (homogeneous physical and chemical properties throughout the layer). The lower layer remains at ambient conditions. As the fire continues to burn, the upper gas layer grows in depth and its temperature changes as well. The model involves the time-dependent solution of a mass and an energy balance for the upper zone.

The pyrolysis rate of the ignition source must be specified by the user. A simple combustion model is employed to determine the heat release rate and products of combustion. The combustion process is governed by the local flowrate of oxygen into the region of the flame; stochiometric combustion equations are modified by empirical expressions. Incomplete burning allows for the transport of unburnt fuel into the upper layer. Combustion in the upper layer occurs whenever any oxygen is present.

As the layer depth drops below the upper edges (soffits) of any vents or openings, smoke and hot gases flow out of the room of origin into adjacent compartments due to the pressure differences between compartments. The model allows for any excess fuel to be transported along with these gases and for combustion to take place outside of the original fire room. As stated by Tanaka, for high fuel pyrolysis rates, the model may predict that most of the combustion takes place outside of the room of origin. It is unclear whether this is a defect in the model or if this will physically occur; large-scale tests are needed for validation.

The heat transfer calculations within the model are quite extensive and include convective and radiative heat transfer between the hot layer and the wall. A time-dependent one-dimensional conduction equation is solved to calculate heat transfer through the walls.

The model allows for the use of shafts to connect floors or deck levels. Unfortunately, these are rather simple and do not allow for a pressure drop along them. Any hot gas which enters a shaft simply rises to the top of it. When the hot gas layer within a shaft reaches a vent into another compartment, transport occurs as between any other two compartments. In effect, shafts are nothing more than compartments which extend for more than one level. In order to use a shaft to represent a ventilation duct requires that it be enlarged greatly.

The model also has a subroutine which allows one to account for wind pressure. The user may specify a pressure coefficient on each of the four outside surfaces (unfortunately, since this code was originally developed for high-rise buildings, it only allows for rectangular compartments). While this pressurization routine is intended to simulate wind effects, we have found that its judicious use along with the vent and shaft routines allows for the modelling of simple HVAC systems. However, our experience clearly indicates that a more sophisticated ventilation shaft routine is needed which accounts for pressure drop and complicated interconnections. In this segment of the study, several computer simulations were run, approximating fires on board the 210' foot USCGC VIGOROUS and the icebreaker POLAR SEA. In each fire, a mass release rate of propane has been specified. This is not to imply that gas burner fires are expected on board such vessels, but rather the release rate should be considered to be the pyrolysis rate of an energy-equivalent amount of liquid or solid fuel. The fire times reported here are relatively short, primarily to minimize computer CPU time. Rather than analyzing slowly growing fires, the release rates typically correspond to shorter, more intense fires.

TWO ROOM BURN

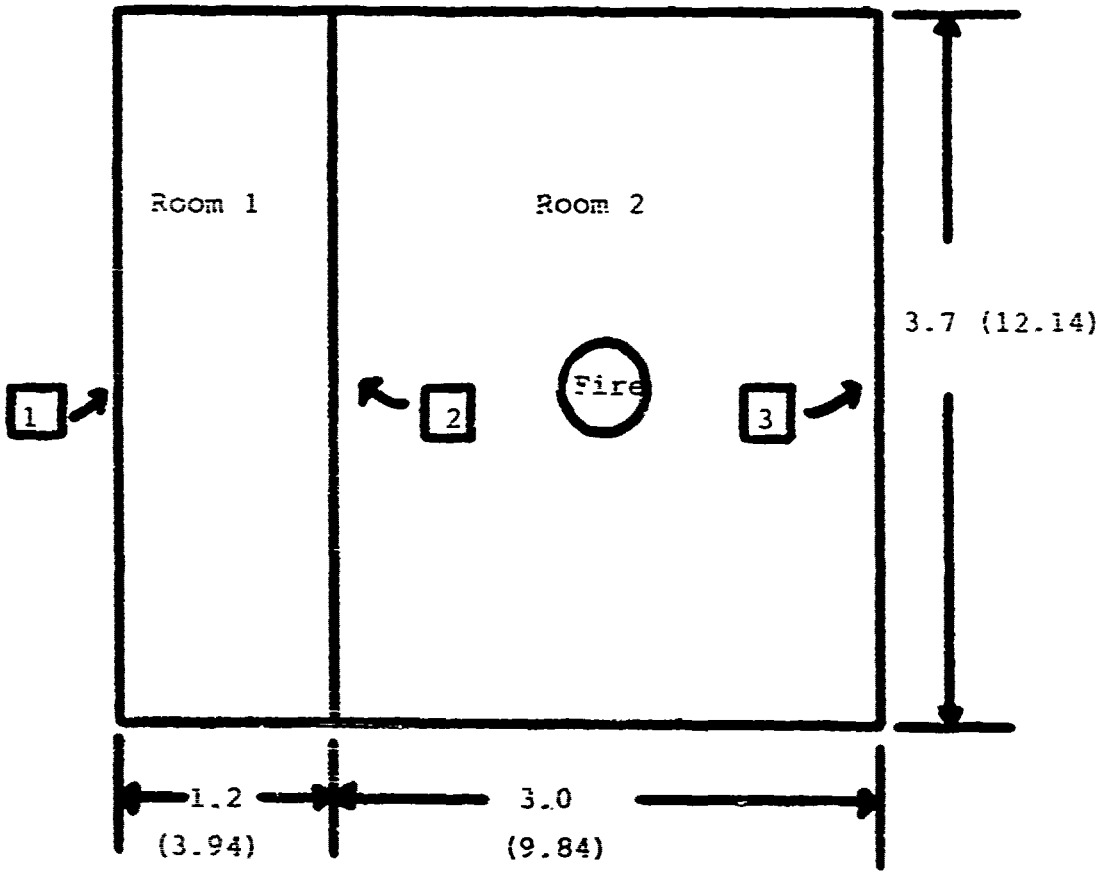
This first simulation involves a single vented compartment opening out to a passageway with an open door. This two-compartment configuration was run with HVAC on and then off. The room layout is shown in Figure 1, with all dimensions in meters; the floor to ceiling height is 3.0 m. The opening dimensions are given:

OPENING	TYPE	WIDTH	HEIGHT	SILL HEIGHT
1	Door	1.0 m	2.0 m	0.0
2	Vent	.28 m	.28 m	.30
3	Vent	.28 m	.28 m	2.72 m

Vent 3 is intended to model a supply duct, vent 2 is out to the passageway, with door 1 at atmospheric pressure.

For simplicity the thermal properties of the walls, ceilings, and floors are taken to be that of two 7/8" thick Marinite 36; these values are used throughout this study. Results are not qualitatively affected by changes in the wall properties.

Thermal conductivity: 26.5 x 10-6 kCal/(m sec K)
Specific heat: .25 kCal/(kg K)
Density: 577. kg/cubic meter
Thermal diffusivity: 1.84 x 10-7 m @/sec
Emissivity: .9



1 1.0 x 2.0m door

2 .28 x .28m open door louvre

3 .28 x .28m supply duct

Fig. 1 Layout for two compartment burn (plan view)

The normal air flow rate through the duct vent was taken to be 400 cfm. The fire was modelled with a given release rate of propane (energy content of 10,700 kcal/kg) at a specified rate into room 2 (Figure 2); this could be thought of as the gassification rate of a solid or liquid fuel with a given heat content. This particular release rate was chosen to represent an arbitrary heavy fuel load.

In the first run, no fuel was released, but sufficient pressure was caused to act on the external vent in compartment two to cause an air flow rate of 400 cfm into the compartment. During a non-fire of 42 seconds, the air flow rate acted virtually in steady state; the air passed through the vent into compartment one and out the door; a small accumulation of air mass occurred, raising the pressure in room 2 by some 5-6 Pa.

This simulation was followed by one in which the fuel release rate was that shown in Figure 2. The hot gas (smoke) layer temperature is shown in Figure 3. Due to oxygen depletion in the fire room, the fire extinguishes itself at about 30 seconds. The smoke/airflow patterns are shown in Figures 4 and 5 for the cases of HVAC off and on, respectively. The arrows labeled S are hot gas flowrates in kg/sec; the arrows labeled A are ambient air flowrates, while vertical arrows show vertical air movement near the door. This phenomena causes some mixing to occur. The hot gas or smoke depth is shown with hatched markings. The layer temperatures are labelled within the hatchings. While smoke concentration is not given, the values would be proportional to the temperature rise above ambient.

Figure 5a indicates the flowrates caused by HVAC. This intense fire quickly caused a drastic rise in room pressure which effectively chocked off the HVAC flow. By 6 seconds, the gas flows and temperatures do not differ significantly from the case without HVAC. By 12 seconds, the fire room is filled with smoke and the pressure exceeds 380 Pa. However, because no head vs. discharge fan characteristics were used in this simulation, one cannot conclude that this would actually occur for a simple two room system. For a multi-room system where he HVAC flows to parallel paths, the flow would tend to follow the path of least resistance. The other major drawback with this analysis is the lack of considering the head loss in any ducting; this can be modeled somewhat by changing flow coefficients at a duct, but was not attempted here.

POLAR SEA BERTHING AREA FIRE

A more complicated berthing area is modelled in Figure 6; this general layout appears in many regions of the ship, but in particular in the CPO berthing area on the main deck of the POLAR SEA. This consists of three rooms in parallel opening to a passageway. The supply ducts into the three rooms are located near the ceiling with small vents in the compartment doors exiting into the hallway just above ground level. The hallway is

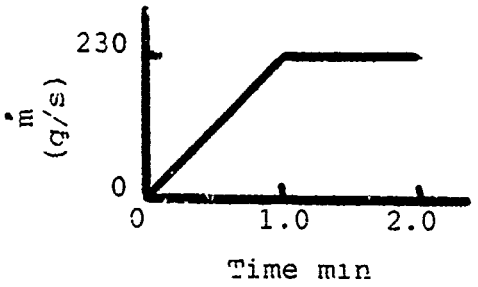


Fig. 2 Propane release rate as a function of time for two compartment burn

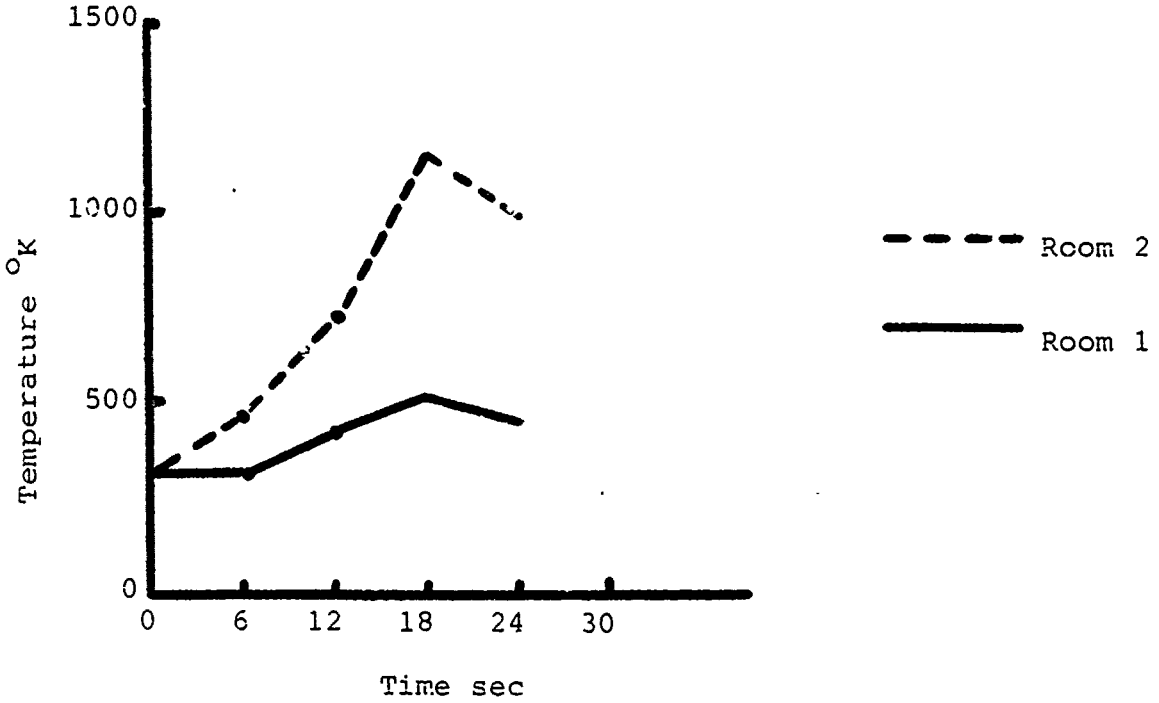


Fig. 3 Temperature vs. time for two compartment burn

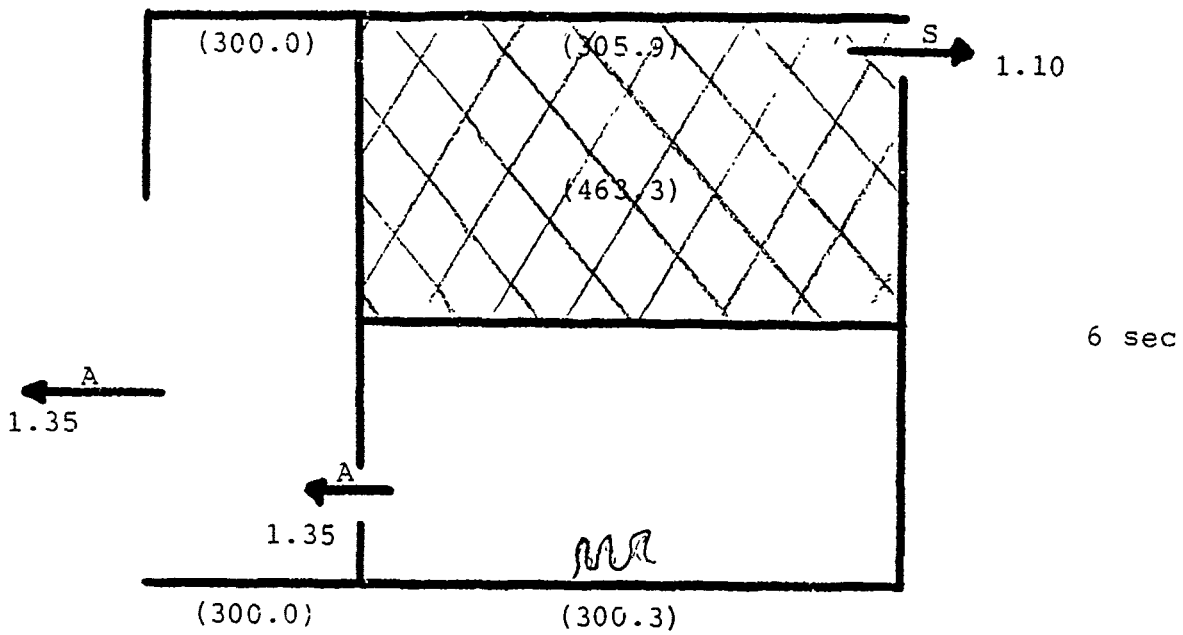


Fig. 4a

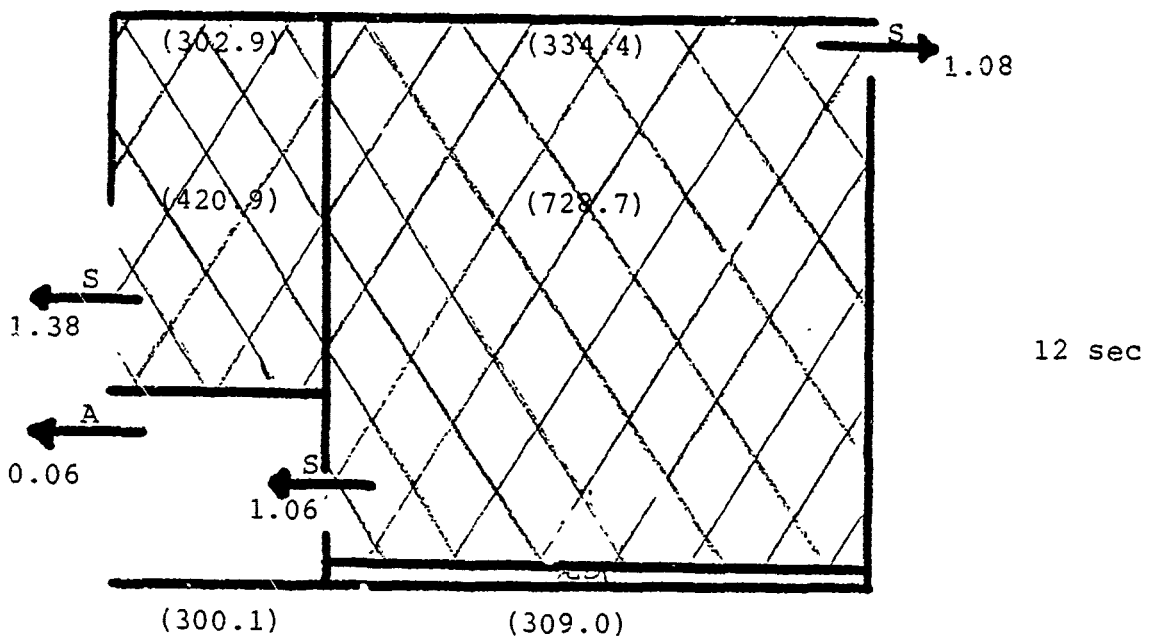


Fig. 4b

Fig. 4 (a-d) Smoke movement for two compartment burn, no HVAC (elevation view)

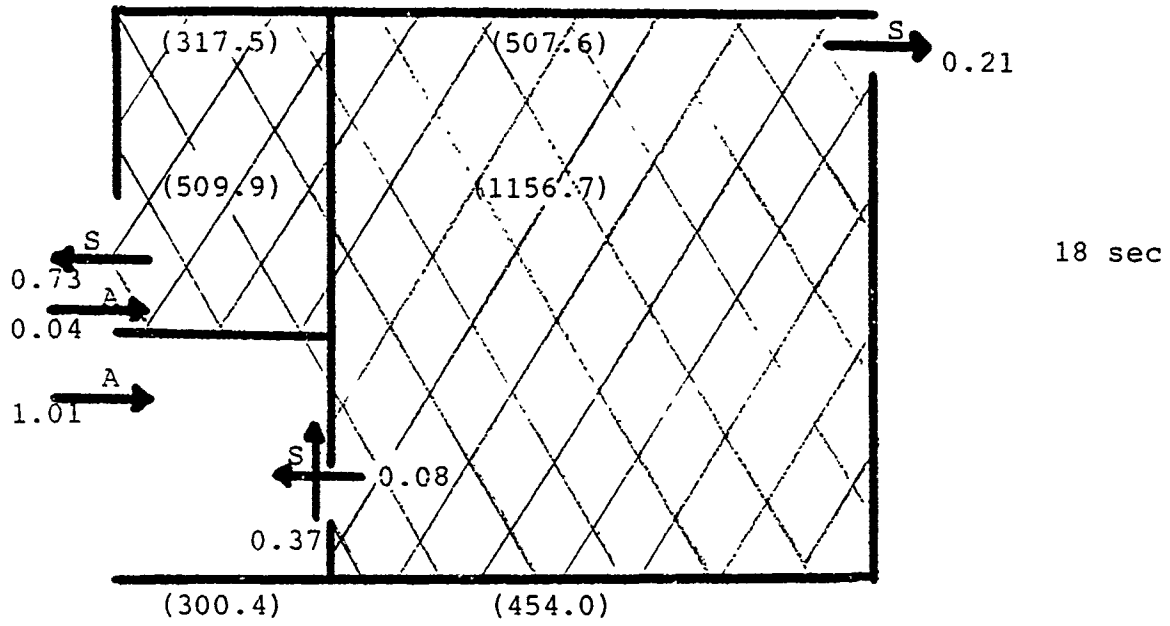

(317.5)
(507.6)
S
0.21
(509.9)
(1156.7)
S
0.73
A
0.04
A
1.01
S
0.08
0.37
(300.4)
(454.0)
18 sec

Fig. 4c

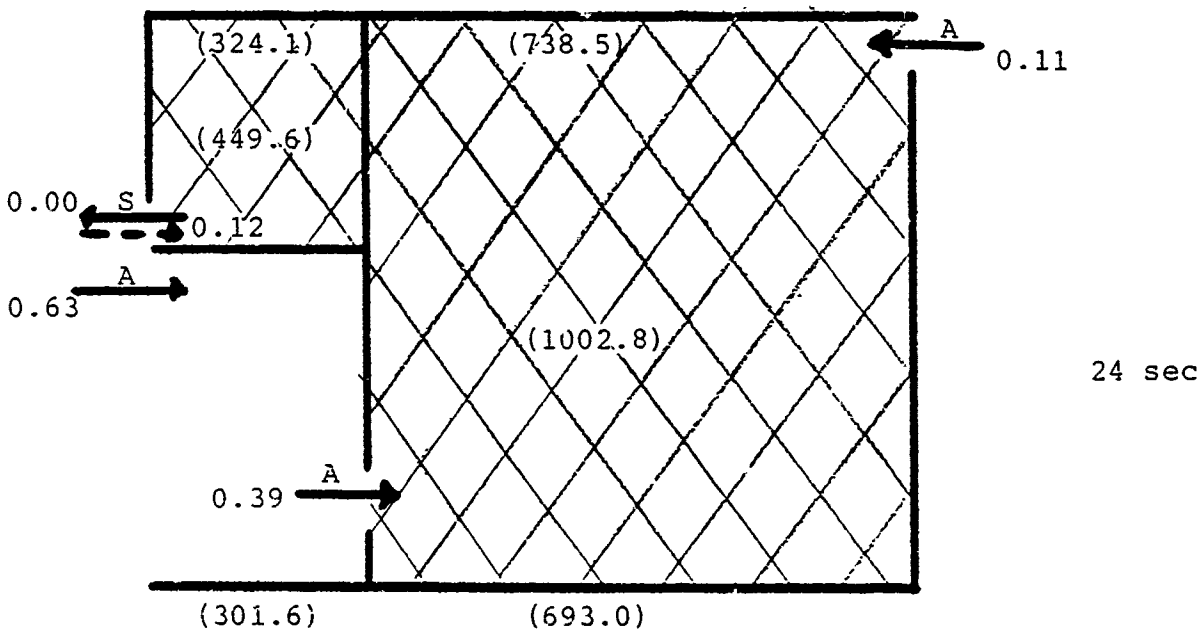

(324.1)
(738.5)
A
0.11
(449.6)
0.00
S
0.12
A
0.63
(1002.8)
24 sec
A
0.39
(301.6)
(693.0)

Fig. 4d

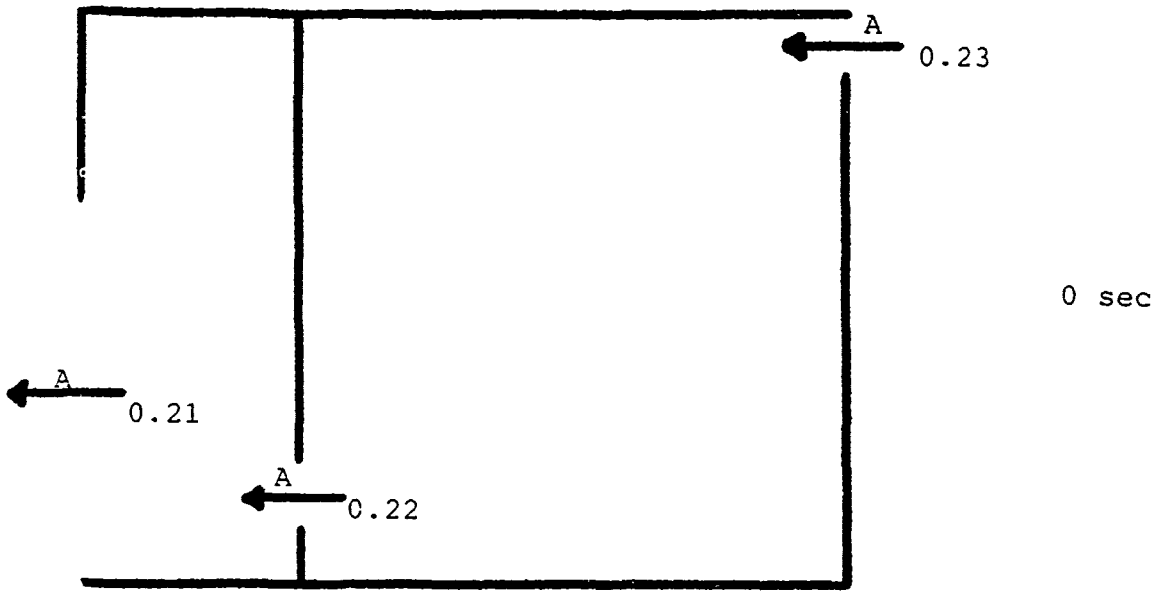


Fig. 5a

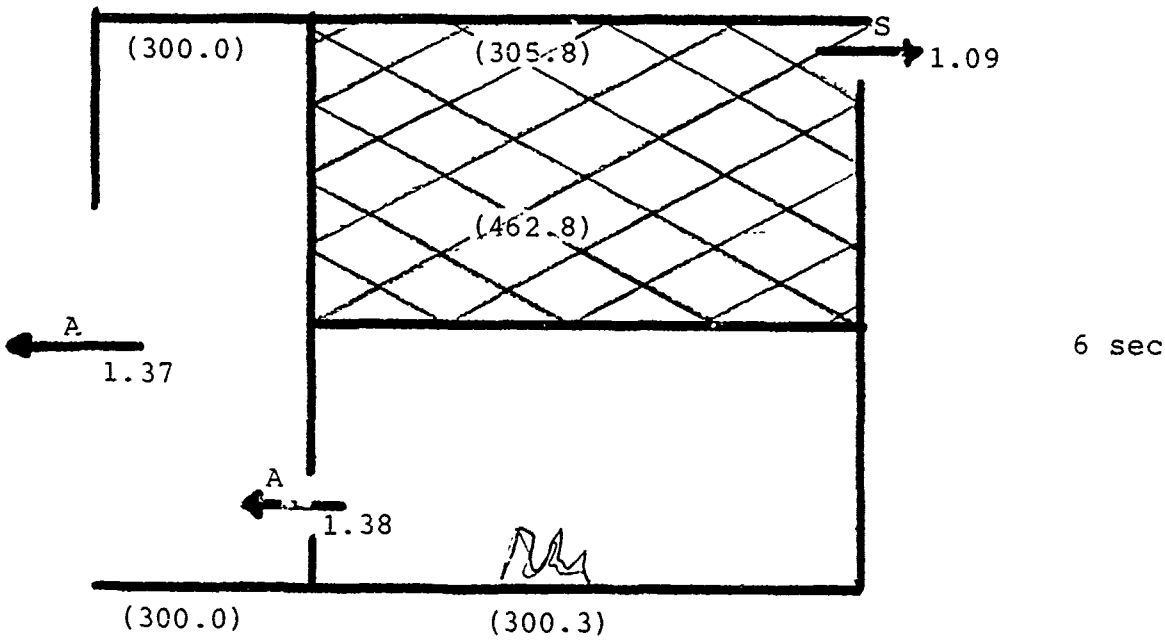
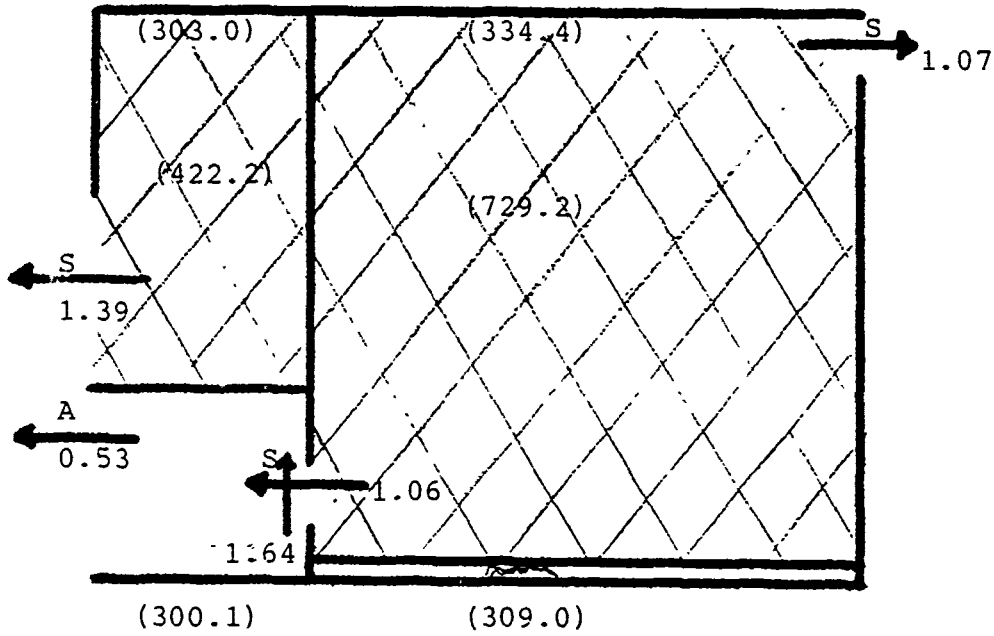


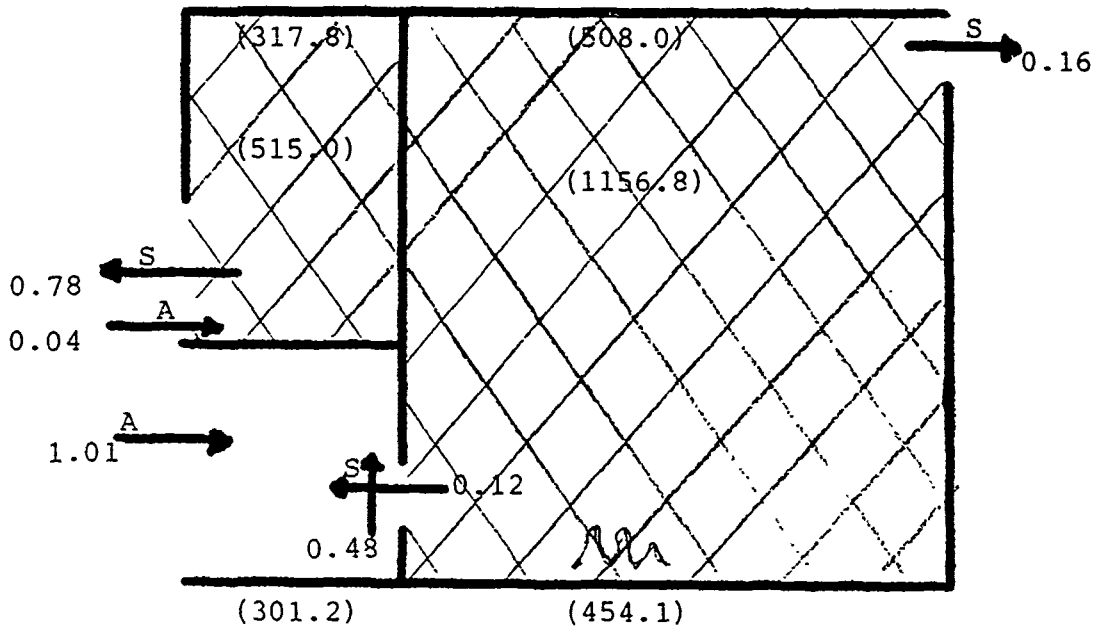
Fig. 5b

Fig. 5 (a-e) Smoke movement for two compartment burn, with HVAC (elevation view)



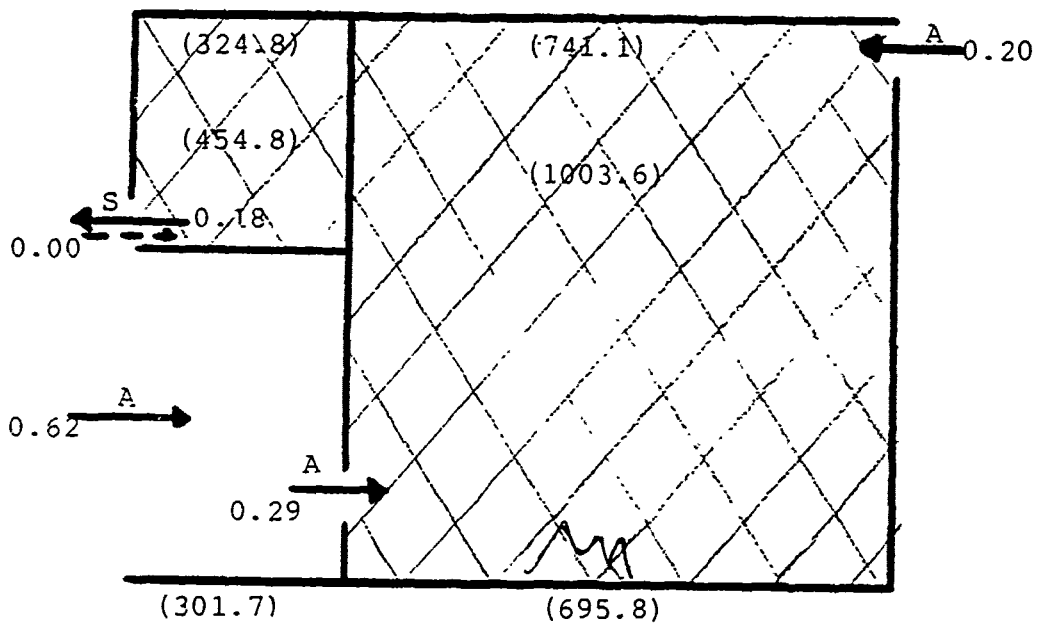
12 sec

Fig. 5c



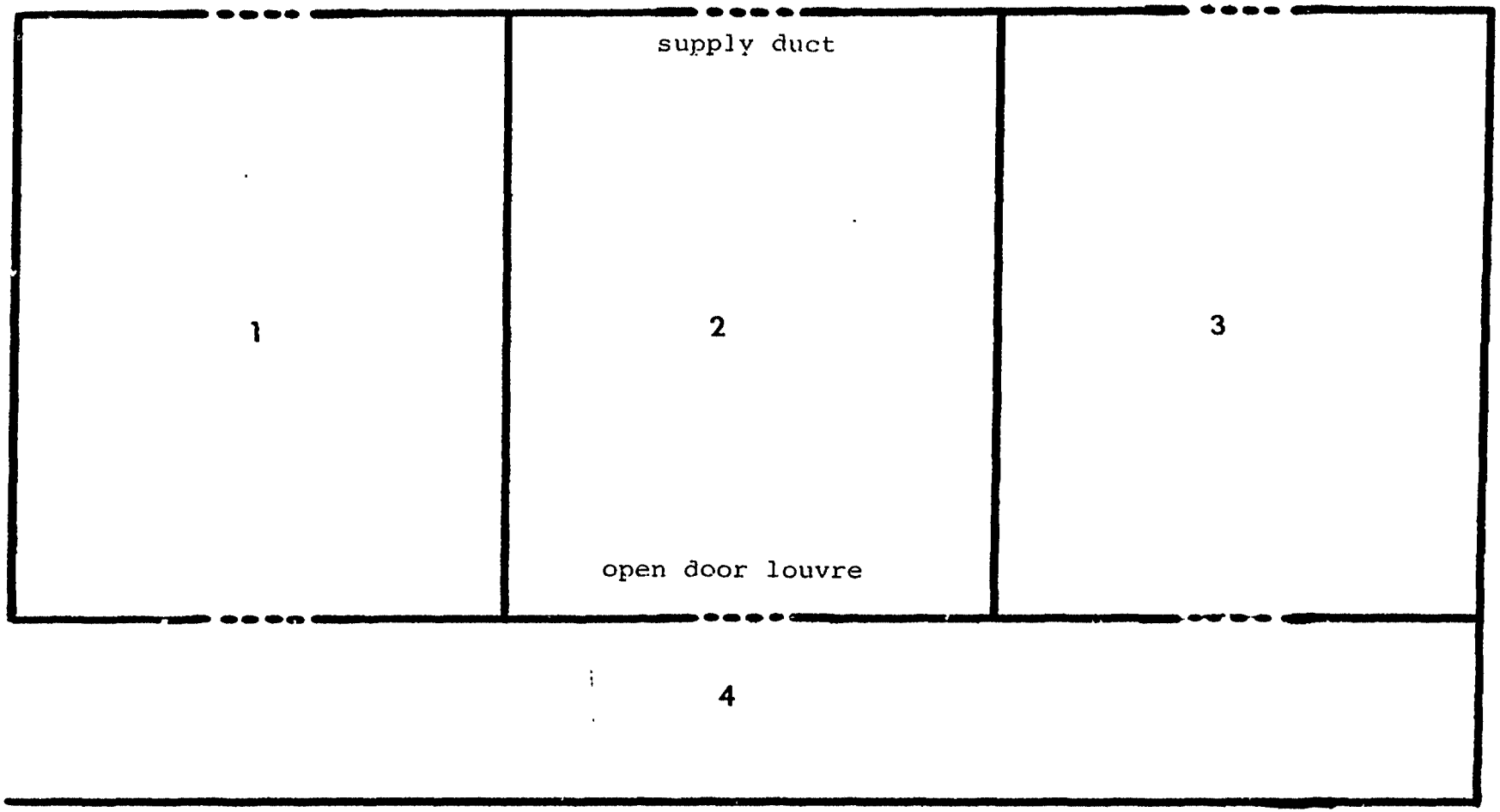
18 sec

Fig. 5d



24 sec

Fig. 5e



1 inch = 1 meter

Fig. 6 Layout for three compartment Polar Sea berthing area burn (plan view)

open at one end with typical return to the atmosphere through a head. Several simulations were made without a fire to adjust the net flowrate through each room to a nominal 400 cfm. This was achieved by either causing a suction at the end of the hall or pressurizing the ducts entering the room.

While results for small fires appeared reasonable with the fire mainly confined to the room of origin (room 2) and smoke filling the hallway, a high fuel load caused rather strange results. While the "hot" gas layer in the fire room (compartment 2) dropped rapidly, no combustion took place. Rather the fuel was carried into the hallway where it burned in a normal fashion. The amount of fuel transported could be controlled by pressurizing the hallway, but nothing would make the fire burn in the proper compartment. This phenomena appears to be the result of Tanaka's combustion algorithm (how much of the gasified fuel will actually be burned); the model predicts a zero oxygen flow to the flame region due to the high airflows. In effect, Tanaka states that this situation arises when the flames would mainly extend through the vents, igniting the fuel in the hall, with very little actually happening in the room of origin. While this certainly seems farfetched, it is a direct result of the combustion model employed.

Because of the unsatisfactory nature of the results obtained with this geometry, they are not presented here.

VIGOROUS OPS BERTHING AREA BURN

Figure 7 schematically shows the layout of a berthing area which was part of a previous SF_6 study (2). A modest fire, modelled with a release rate of 10 g/sec of propane, starts in the OPS berthing area. This compartment is connected to the deck berthing by a hatch; this is modelled as a vertical shaft. An open WTD connects the deck berthing to an aft passageway which is open to two parallel networks. We have modelled one long passageway and its connecting compartments as an ambient vent. The other compartments modelled are the first class quarters which opens to the maindeck head. The head is considered to be open to ambient by a return duct (vent). For this simulation, no HVAC was used, since it is standard practice to shut down such systems once a fire is detected. Figure 8 shows the smoke depth as it grows with time. By 30 seconds, smoke has begun to move into the aft passageway. By 120 seconds, the fireroom is completely filled with smoke, the deck berthing is over half full, but there is little change elsewhere. Indeed, there is no measurable airflow of any kind leaving the passageway. At 150 seconds, the smoke depth in the deck berthing and the passageway have decreased slightly.

Figure 9 shows the temperature in the three affected compartments as a function of time. Surprisingly, the passageway temperature is higher than that in deck berthing. However, it must be remembered that the smoke layer depth in the passageway

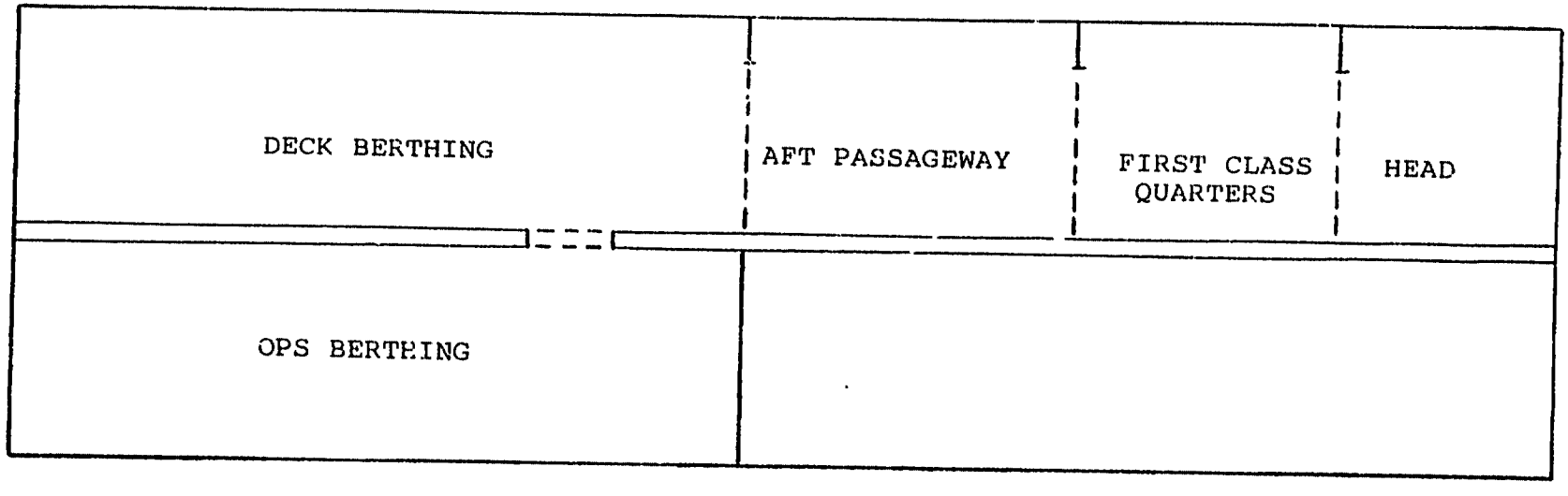


Fig. 7 Compartment layout for OPS Berthing Area burn (elevation view)

30 seconds

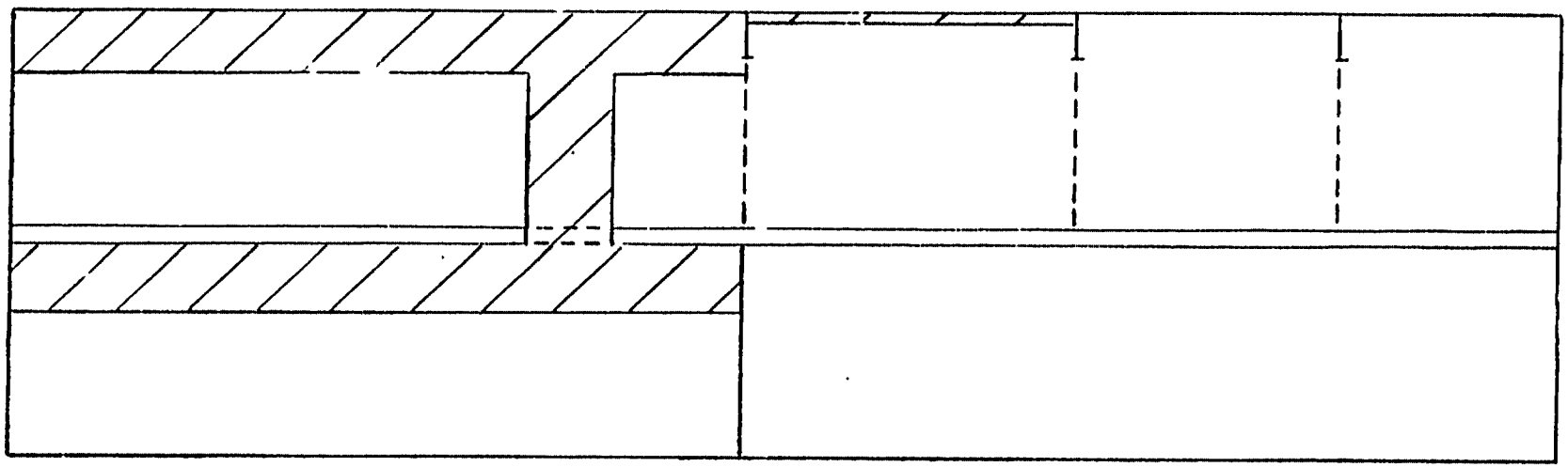


Fig. 8a

Fig. 8 (a-e) Smoke movement for OPS berthing area burn (elevation view)

60 seconds

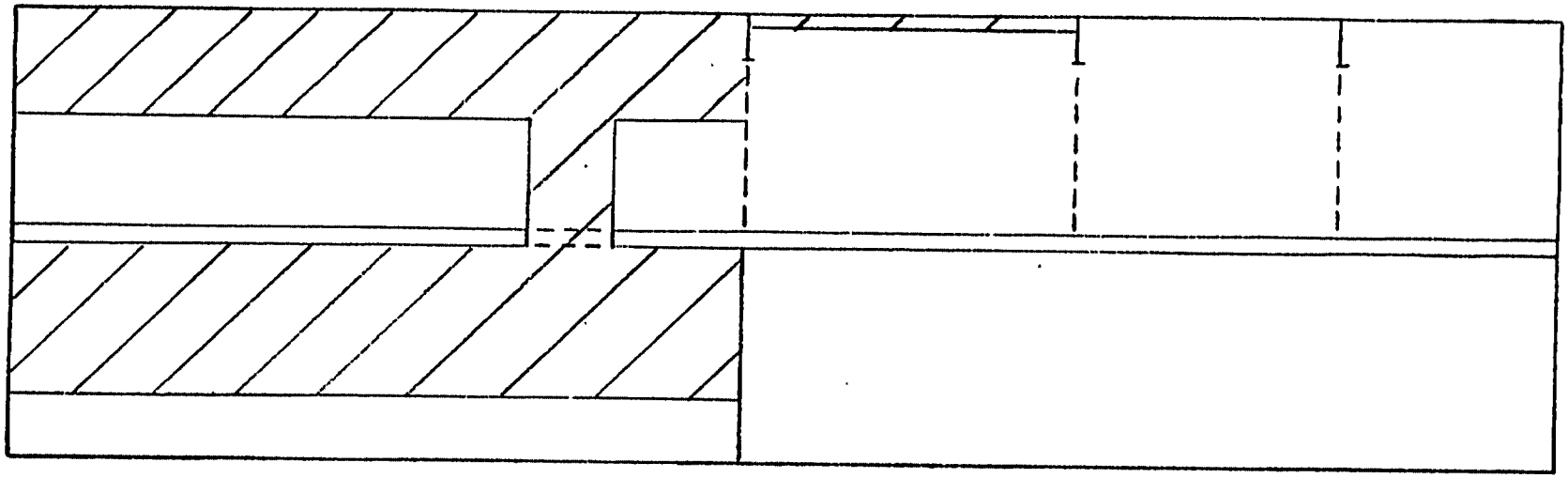


Fig. 8b

90 seconds

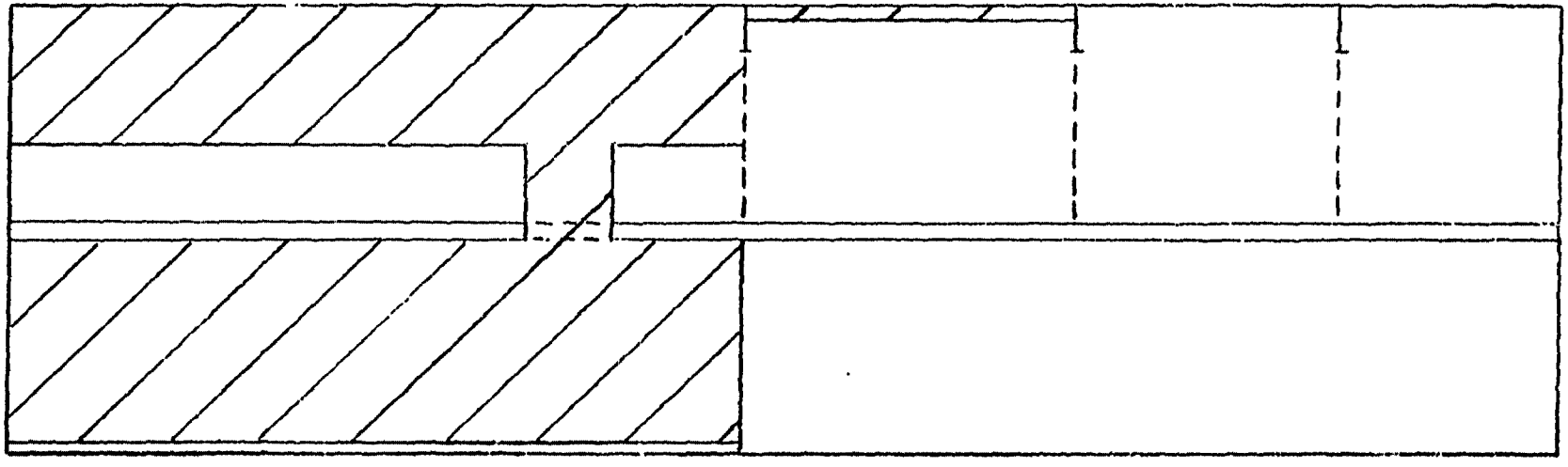


Fig. 8c

120 seconds

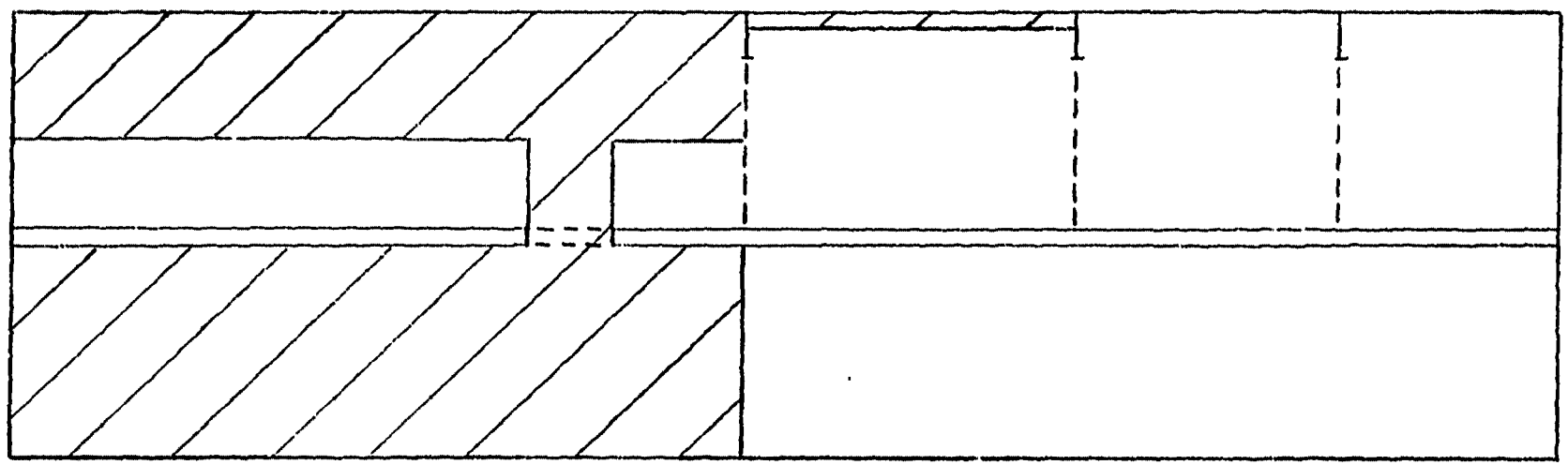


Fig. 8d

150 seconds

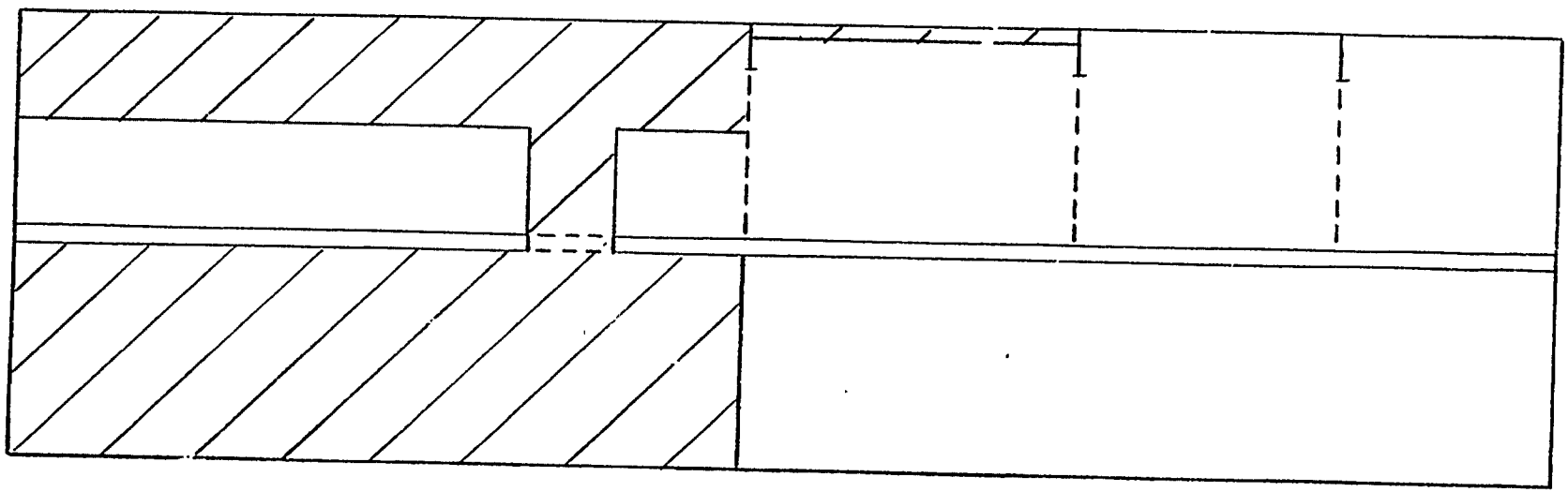


Fig. 8e

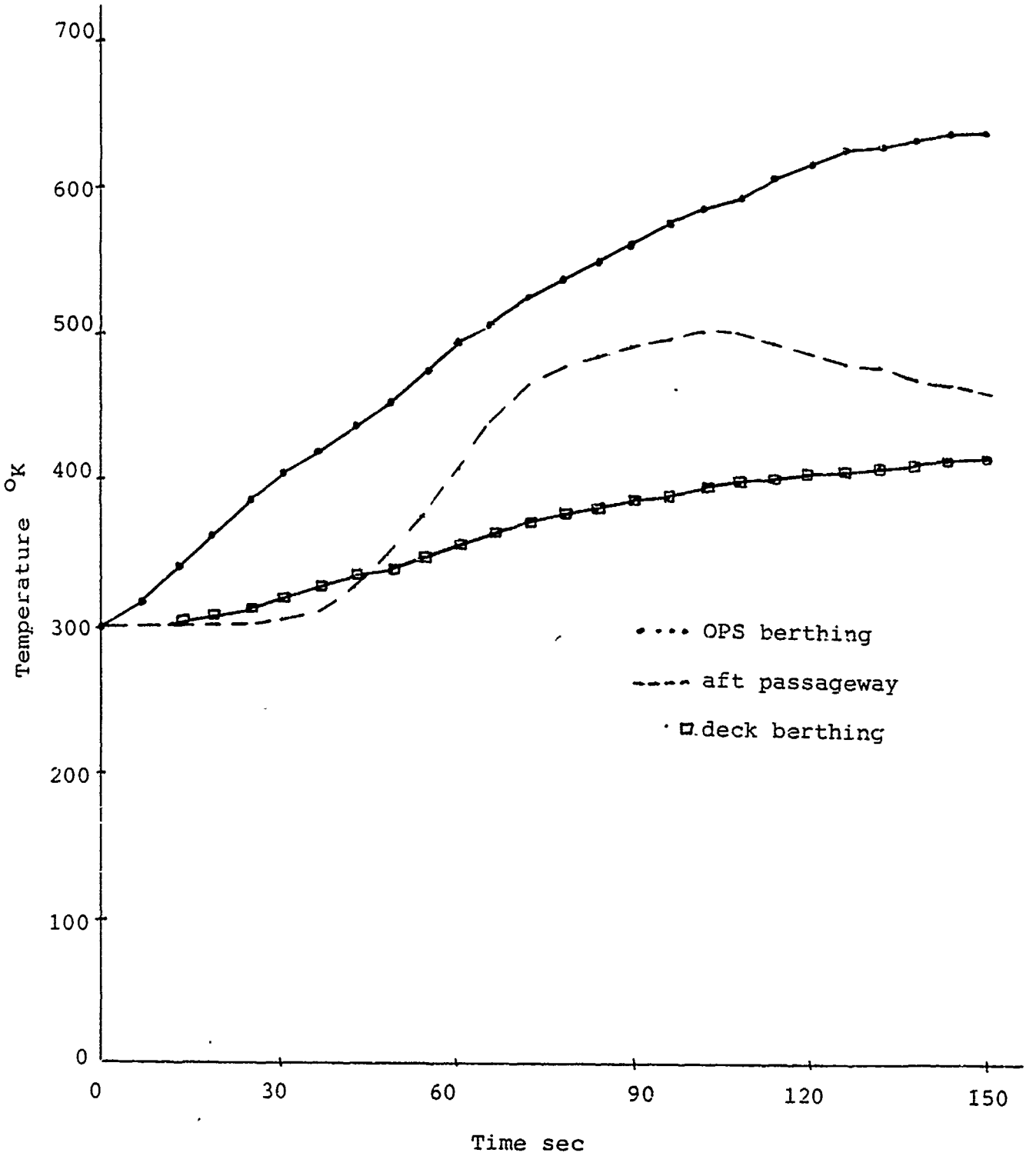


Fig. 9 Temperature vs. time for OPS berthing area burn

is very small and that if the layer were mixed uniformly in the compartment the concentration would be small. Gas concentration for the passageway is shown in Figure 10.

The general results from this simulation appear reasonable, and qualitatively agree with the SF_6 tests. However, the most surprising finding of the SF_6 test was a higher concentration within the head than in first class quarters. For the model fire, the two layer assumption prevents the movement of gas any further than the passageway. The depth would have to drop below the first class soffit before moving into that compartment. Since SF_6 is effectively "cold smoke" (well-mixed rooms), a direct comparison of results is not possible. It is anticipated that a simulation which includes HVAC would cause the spread of smoke into other compartments.

POLAR SEA PAINT LOCKER BURN

The next simulation is for the paint locker in the POLAR SEA. The locker is approximated as a compartment 2.7 m x 5.8 m x 2.3 m with no connections except for a ventilation return duct which passes into the windlass room (7.3 x 10.7 x 2.3) as a tee and exits on deck into the atmosphere. The WTD between the compartments is considered closed.

The model layout which corresponds to this configuration is shown in Figure 11. The paint locker is vented to a shaft which opens to the outside and also to the windlass room. The shaft, which simulates the ventilator duct, is drawn to scale as it is input to the model. While the geometry is obviously distorted, the ventilation behavior is reasonably mimicked with this system. In the actual case, the smoke flow would be controlled by the pressure difference between compartment 1 and 2 and between 2 and ambient. In the conceptualized system, smoke will immediately pass into the shaft and exit to the outside. When the smoke reaches the windlass vent, the flows will be controlled by the pressure differences across each vent. A heavy fuel load (shown in Figure 12) of 100 g/sec of propane was pyrolyzed in room 2. The gas concentrations in compartment 2 are shown in Figure 13. Note the rapid fall in oxygen within the paint locker; by 60 seconds the fire extinguishes due to lack of oxygen. Figure 14 shows the gas concentrations in compartment 1. Modest levels of smoke find their way through the ventilation system, even after the fire has extinguished. Figure 15 indicates that the pressures within the two rooms are actually negative with respect to ambient; this due to the lack of supply air to the fire room. The temperatures within the two rooms are plotted in Figure 16.

The actual smoke/gas movement is shown schematically in Figure 17. At 12 seconds, most of the gas flows out to the atmosphere, although the fireroom is rapidly filling with smoke and hot gas. Note that there appears to be a net airflow into the ship. By 30 seconds, the fireroom is uninhabitable. Most of the smoke exits to the atmosphere but a layer is forming in the

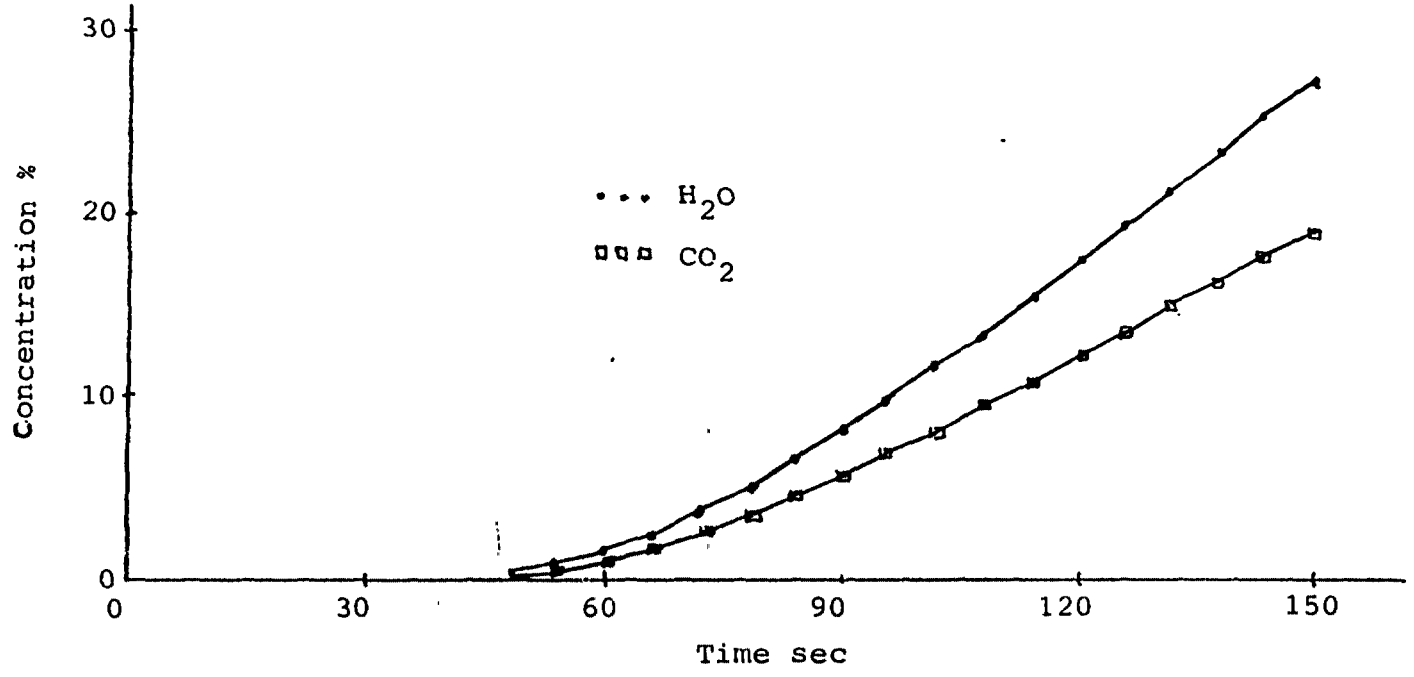


Fig. 10 Gas concentration vs. time for passageway

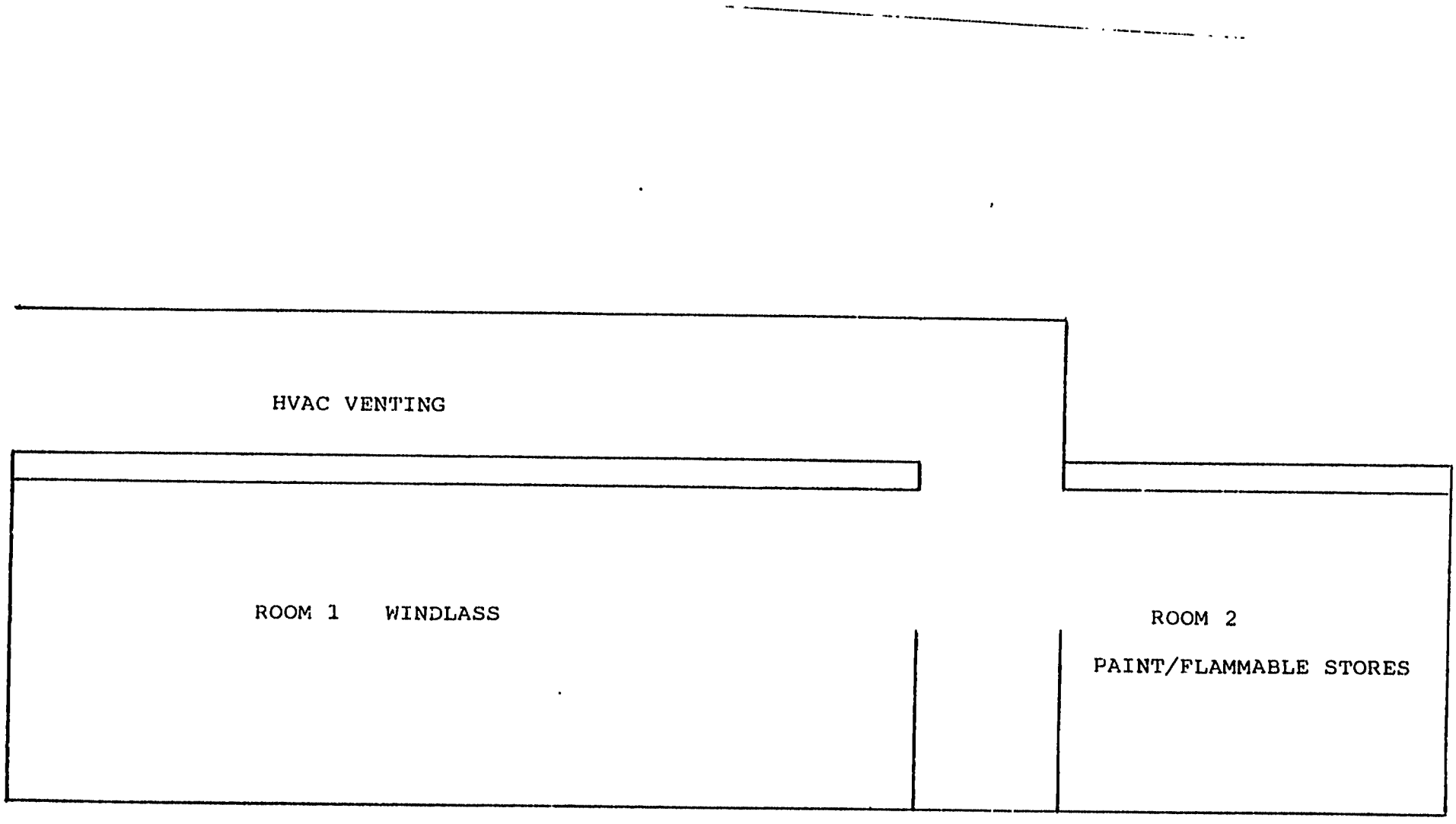


Fig.11 Polar Sea Main Deck Layout (elevation view)

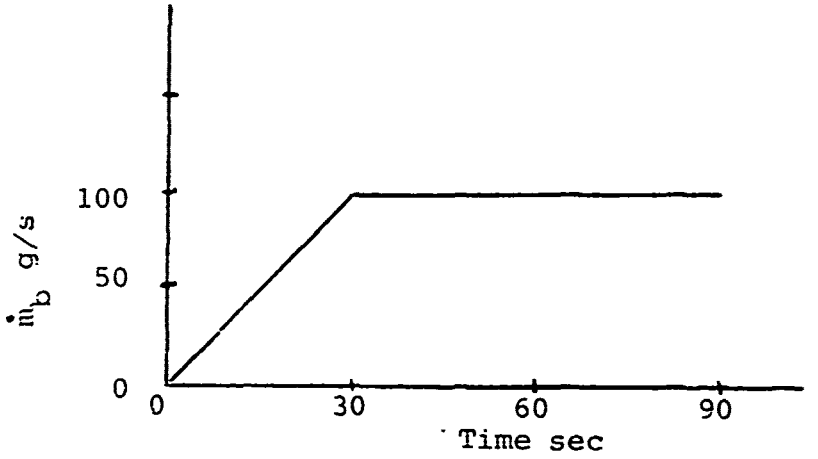


Fig. 12 Mass burnrate vs. time

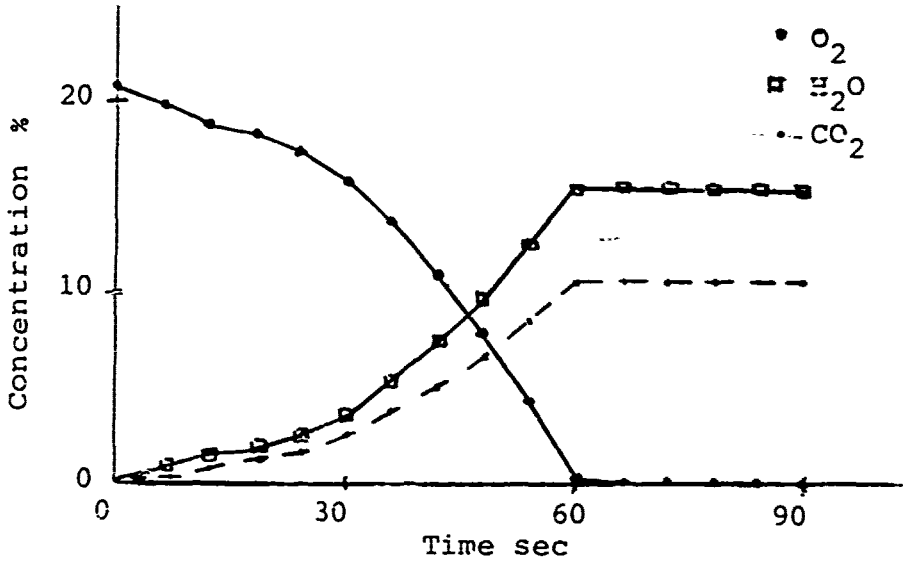


Fig. 13 Gas concentrations in Room #2

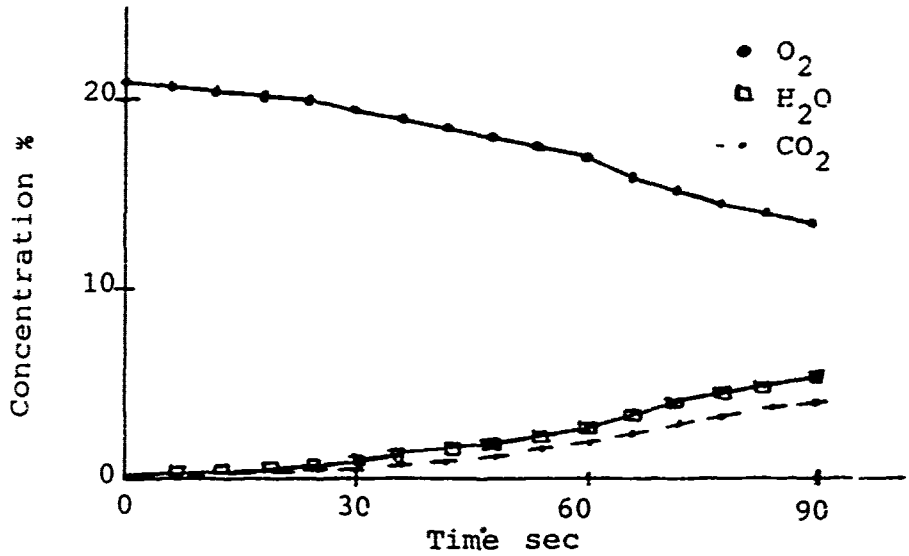


Fig. 14 Gas concentrations in Room #1

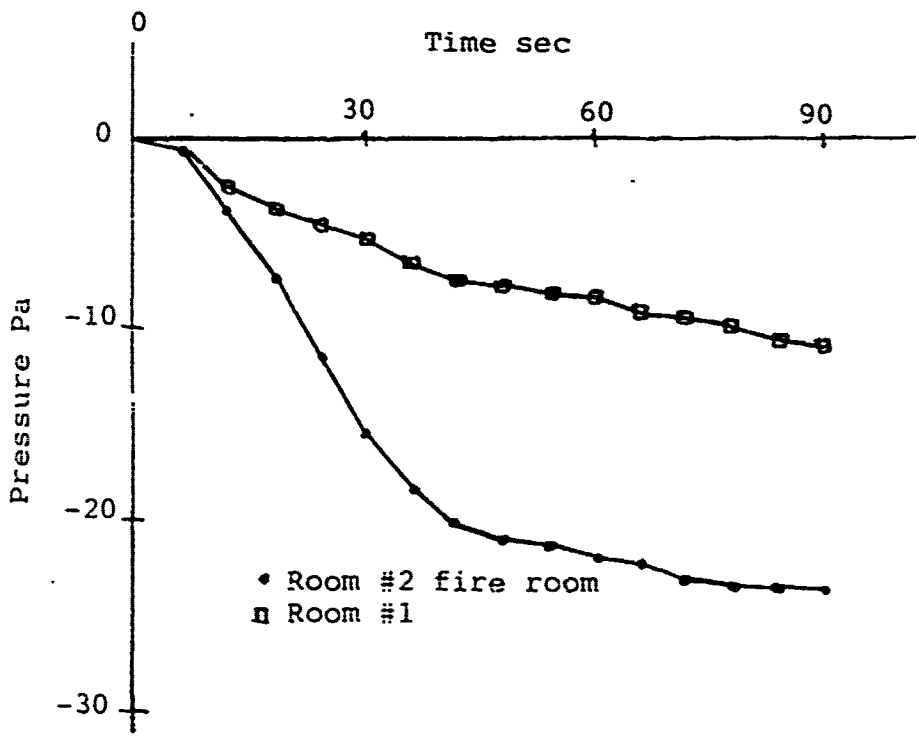


Fig. 15 Relative pressures at ground level

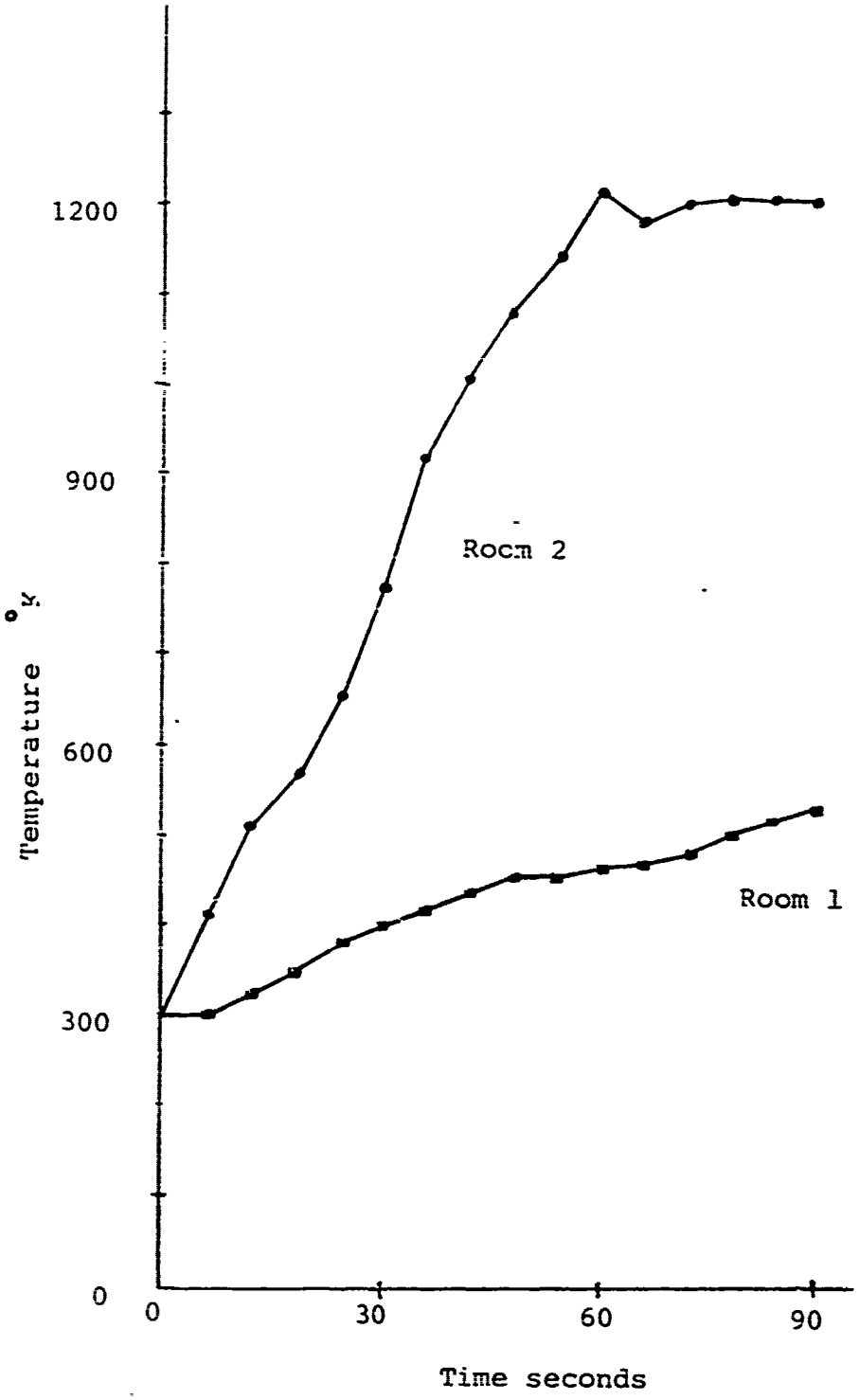


Fig. 16 Hot layer temerature vs. time for Polar Sea Paint Locker Burn Gasification rate is 100 g/s.

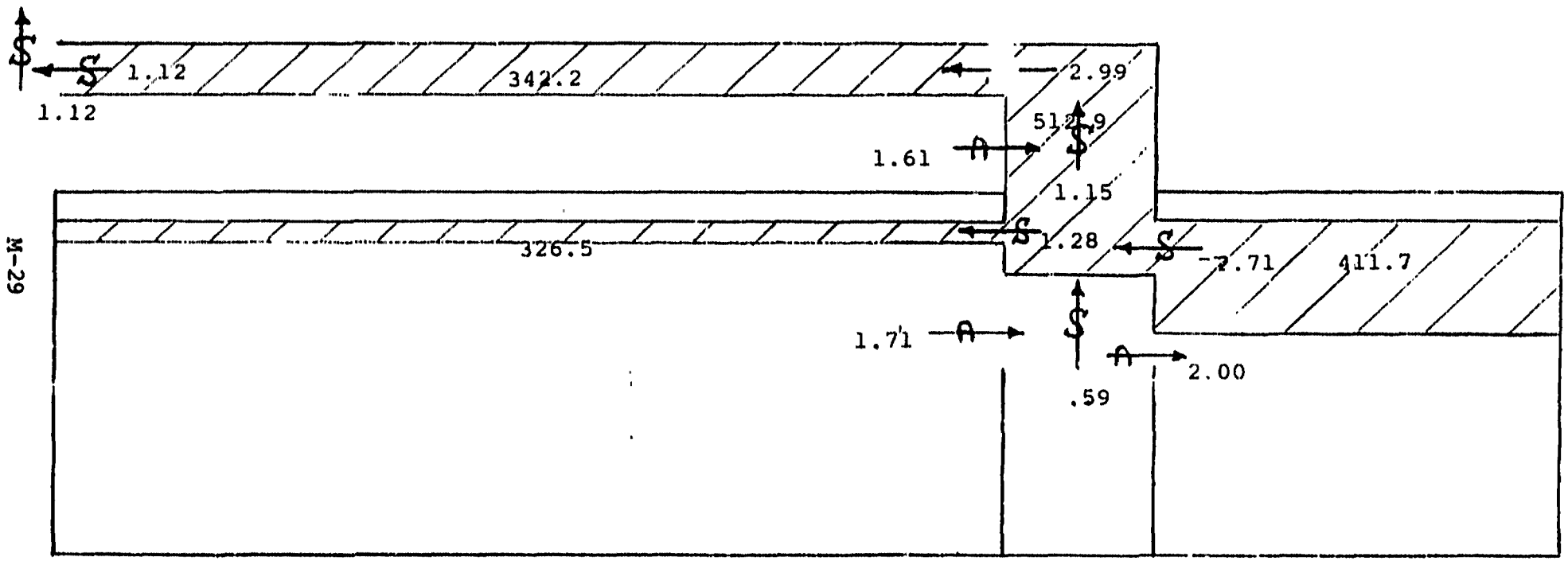


Fig. 17a Polar Sea Paint Locker Burn Time = 12 seconds (elevation view)

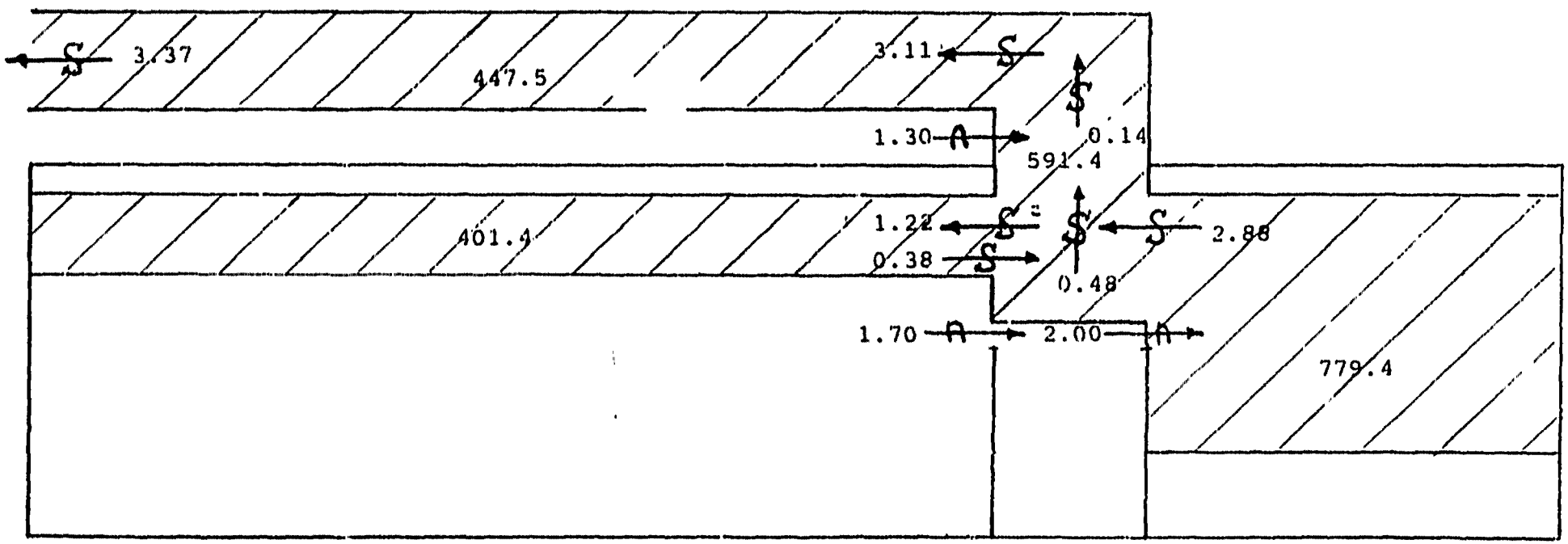


Fig.17b Polar Sea Paint Locker Burn Time = 30 seconds

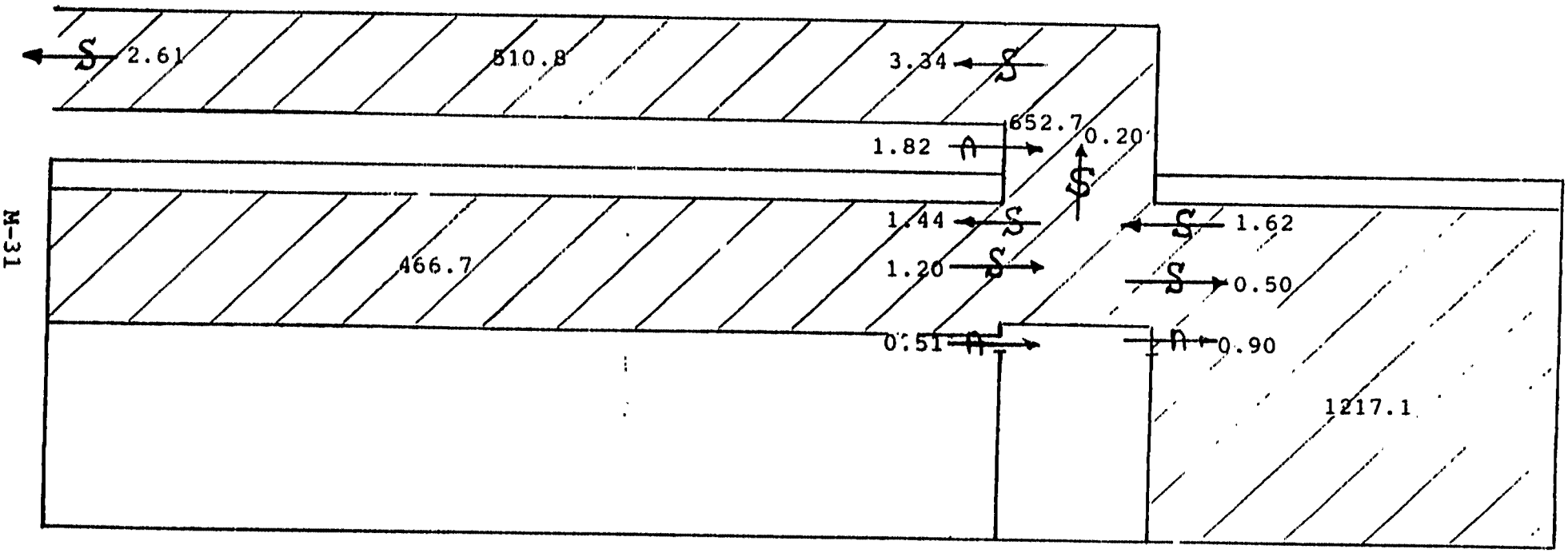


Fig. 17c Polar Sea Paint Locker Burn Time = 60 seconds

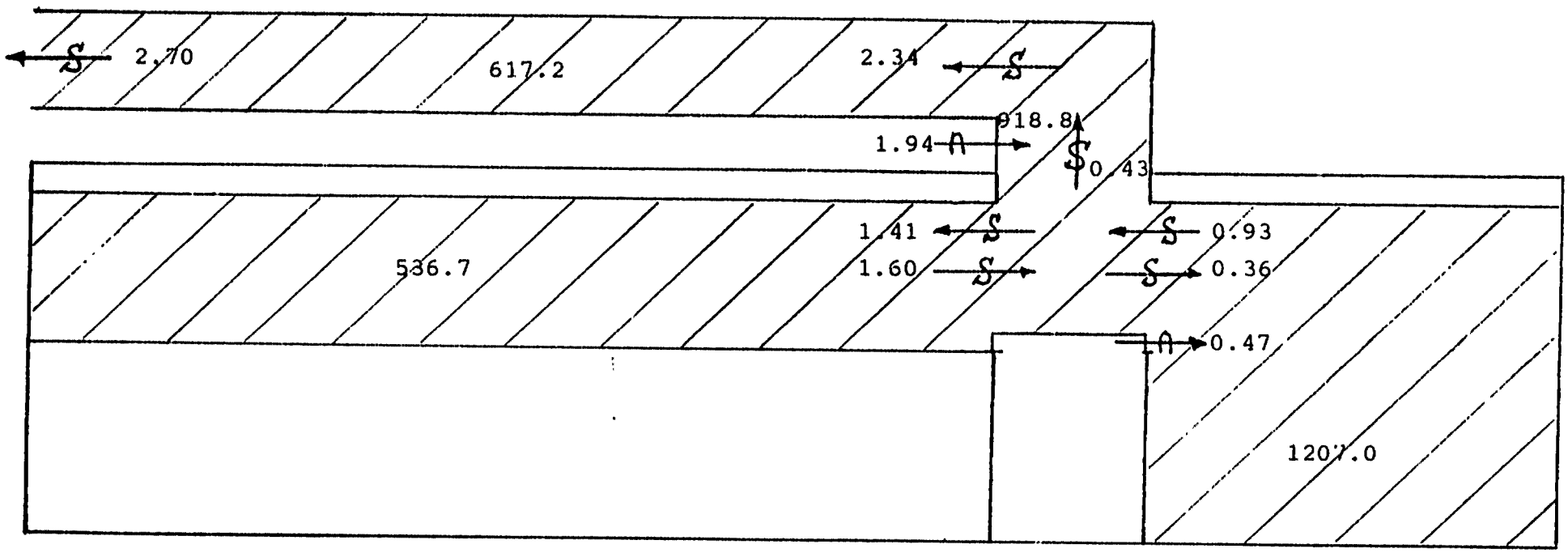


Fig.17d Polar Sea Paint Locker Burn Time = 90 seconds

windlass room. At 60 seconds, the fireroom is completely filled with smoke, and the oxygen levels have reached zero. At 90 seconds, little is changing, except that the hot gas from the fireroom continues to flow out, continuing to raise the temperature and smoke concentration in compartment 1, although the smoke depth is not greatly changing.

This scenario was also run with a lighter fuel load of 50 g/sec; the resulting temperatures are shown in Figure 18. In this case, enough air continues to supply the fire in compartment 2 and the fire does not extinguish. The basic air/smoke movement is otherwise similar to the heavier fuel load.

TWO LEVEL BURN SCENARIO

The next scenario models a common shipboard fire situation. A fire begins on one level and the products of combustion pass up through a scuttle or open hatch to a second (or third level). For example in the SF_6 test on the USCGC VIGOROUS, the paint locker is connected to the bosun's hold by an open hatch, and the bosun's hold is connected by an open stairwell to a forward passage. In the berthing area, the OPS berthing is connected to the deck berthing by a stairwell, which is connected to the aft passage by an open WTD. To model this a 50 g/sec fire is started in a compartment which is fully open to a shaft. The shaft is also open to "another compartment," actually the other part of the fire room, on the same level. A similar configuration exists on the second level. In this particular run, the upper deck is open to the atmosphere through a door vent, so that smoke may pass into other compartments.

Figure 19 shows the smoke movement schematically. At 12 seconds, most of the smoke passes into the upper compartment. Indeed, the model leaves part of the fireroom smokefree (remember that the model actually has broken up each level into two compartments separated by a shaft). While the fireroom gas is hotter, the smoke depth is less. A fair amount of smoke is already passing into the next compartment on the upper deck. By 30 seconds, the upper deck is completely filled with smoke, although the concentrations are less than in the fireroom; again the smoke concentrations are proportional to the indicated gas temperatures above ambient. By 60 seconds, both levels of the ship are filled with smoke with the concentration in the upper level approximately half that in the fire room. Note that this configuration actually allows one to achieve temperature/concentration gradients within a large room, even though zone models require a single layer height and temperature for each compartment.

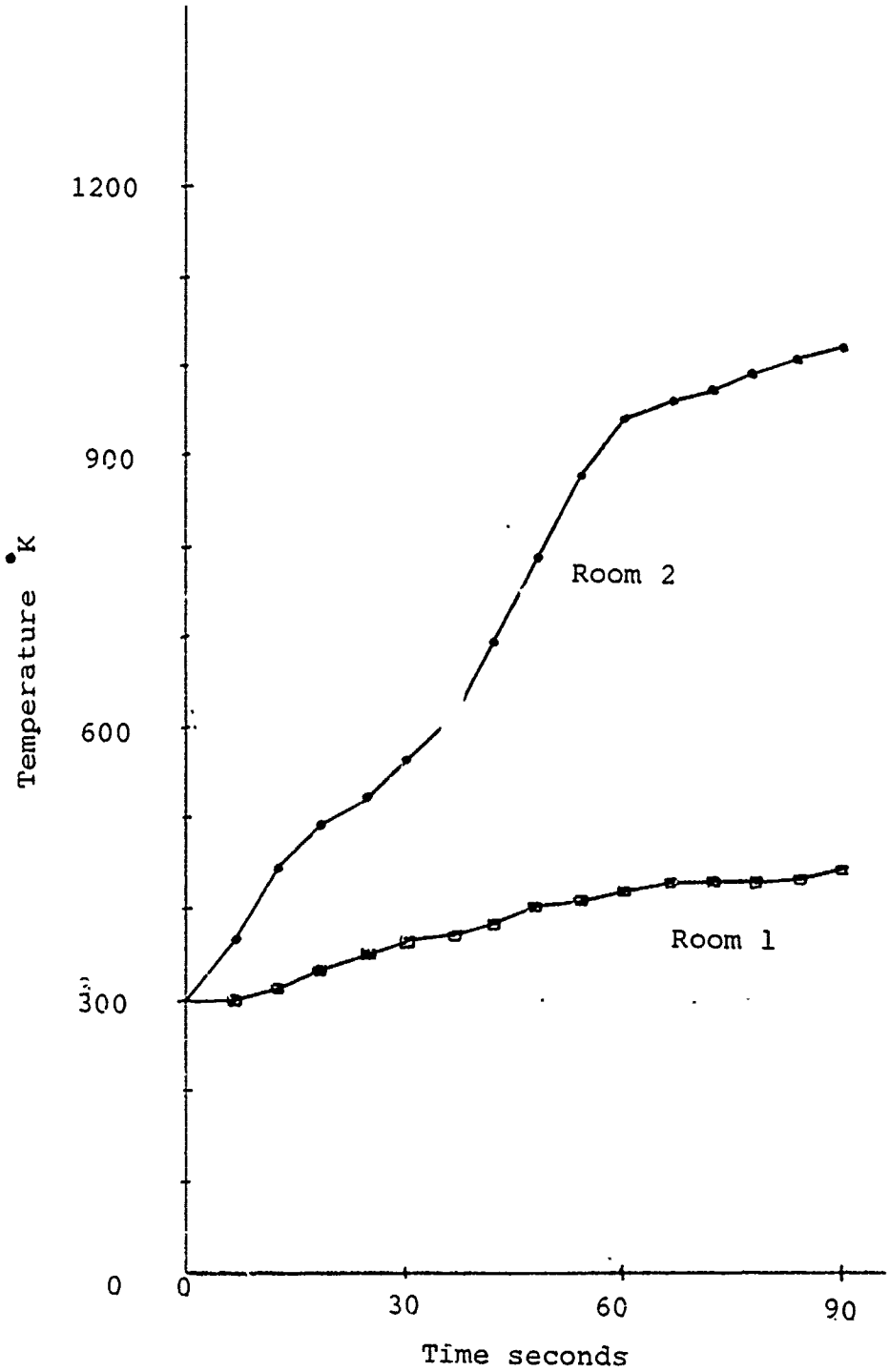


Fig. 18 Hot layer temperature vs. time for Polar Sea Paint Locker Burn Gasification rate is 50 g/s.

Fig. 19a 12 seconds

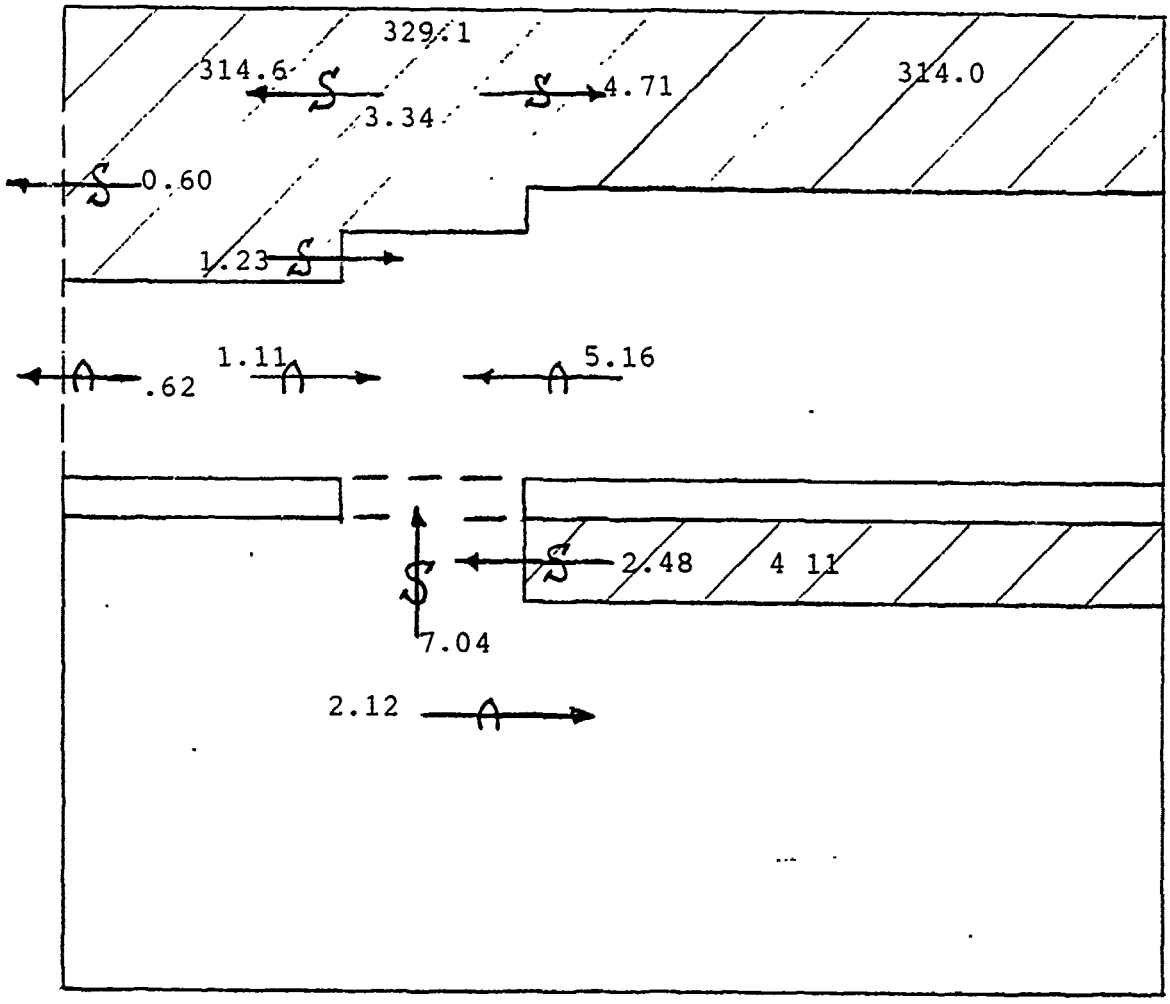


Fig. 19 (a-c) Smoke movement for two level burn (elevation view)

Fig. 19b 30 seconds

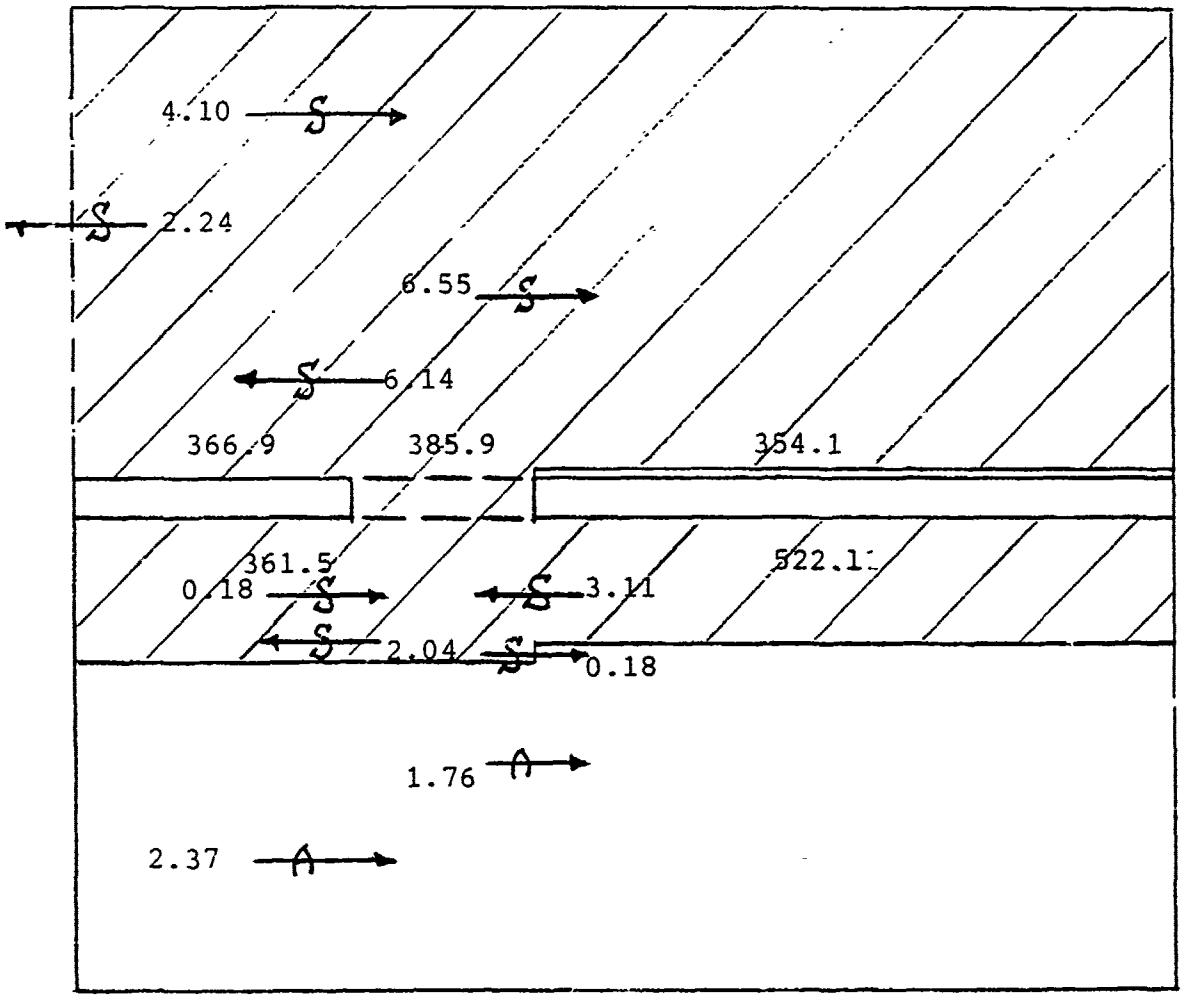
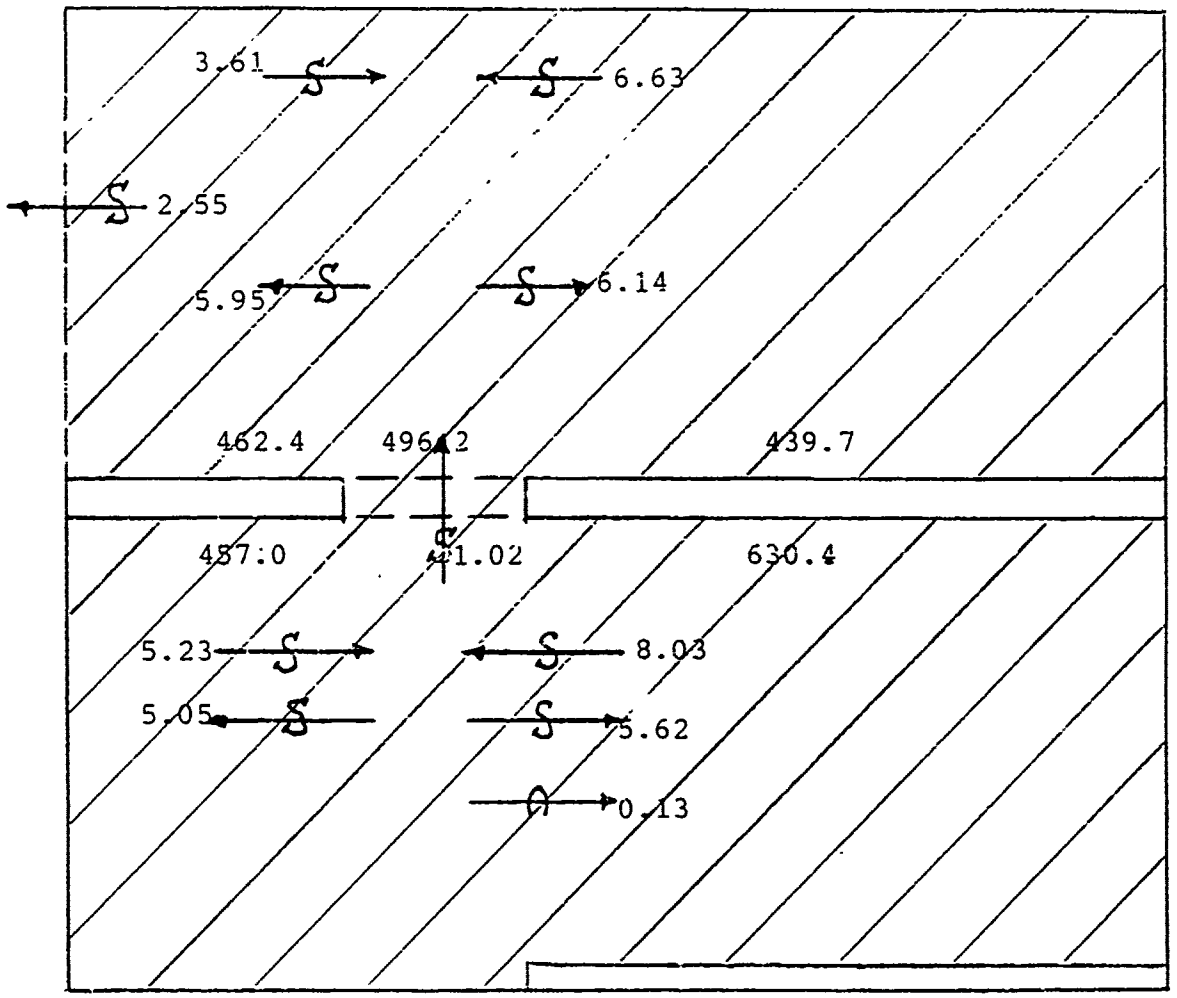


Fig. 19c 60 seconds



VIGOROUS PAINT LOCKER BURN

Two major scenarios exist for a paint locker burn on the USCGC VIGOROUS. If the scuttle is open between the locker and the bosun's hold, smoke will pass into the hold and through the stairwell into the forward passage. From there, the concentrations which appear in the laundry depend on whether the connecting WTD is open or not. If the WTD is closed, smoke will travel through the ducting to the laundry and eventually to the morale locker. Since this scenario is quite similar to others looked at, results are not presented here.

A second case exists when the paint locker is isolated from the bosun's hold. Without dampers, smoke can travel through the supply duct into a tee which connects to both the laundry and the morale locker and eventually to the outside. The temperatures predicted in the three compartments for this scenario are shown in Figure 20. By 90 seconds, the oxygen levels in the paint locker are quite low and combustion is limited. Figure 21 shows the smoke layer growth over time. While the paint locker quickly fills with smoke, the layer depth on the upper level remains small. The smoke flowrate out of the ship varies from .3 - .6 kg/s early in the fire, but drops to .05 kg/s as combustion slows down.

CONCLUSIONS

This work used Tanaka's BRI computer code to model a variety of fire scenarios which could occur on the USCGC VIGOROUS, the icebreaker POLAR SEA, or the PIR. Using the shaft, vent, and wind pressure routines allows one to simulate ceiling vents (scuttles, etc.), passive ducting and active HVAC. For the most part the results seem reasonable, although there appears to be a problem with the combustion model in certain cases. Because of the two layer assumption inherent in the zone model, no direct comparison could be made with existing SF_6 data. However, qualitative agreement was found. The code does need a better horizontal vent routine and should include head loss in ducts, so that more complicated ducting interconnections could be modelled.

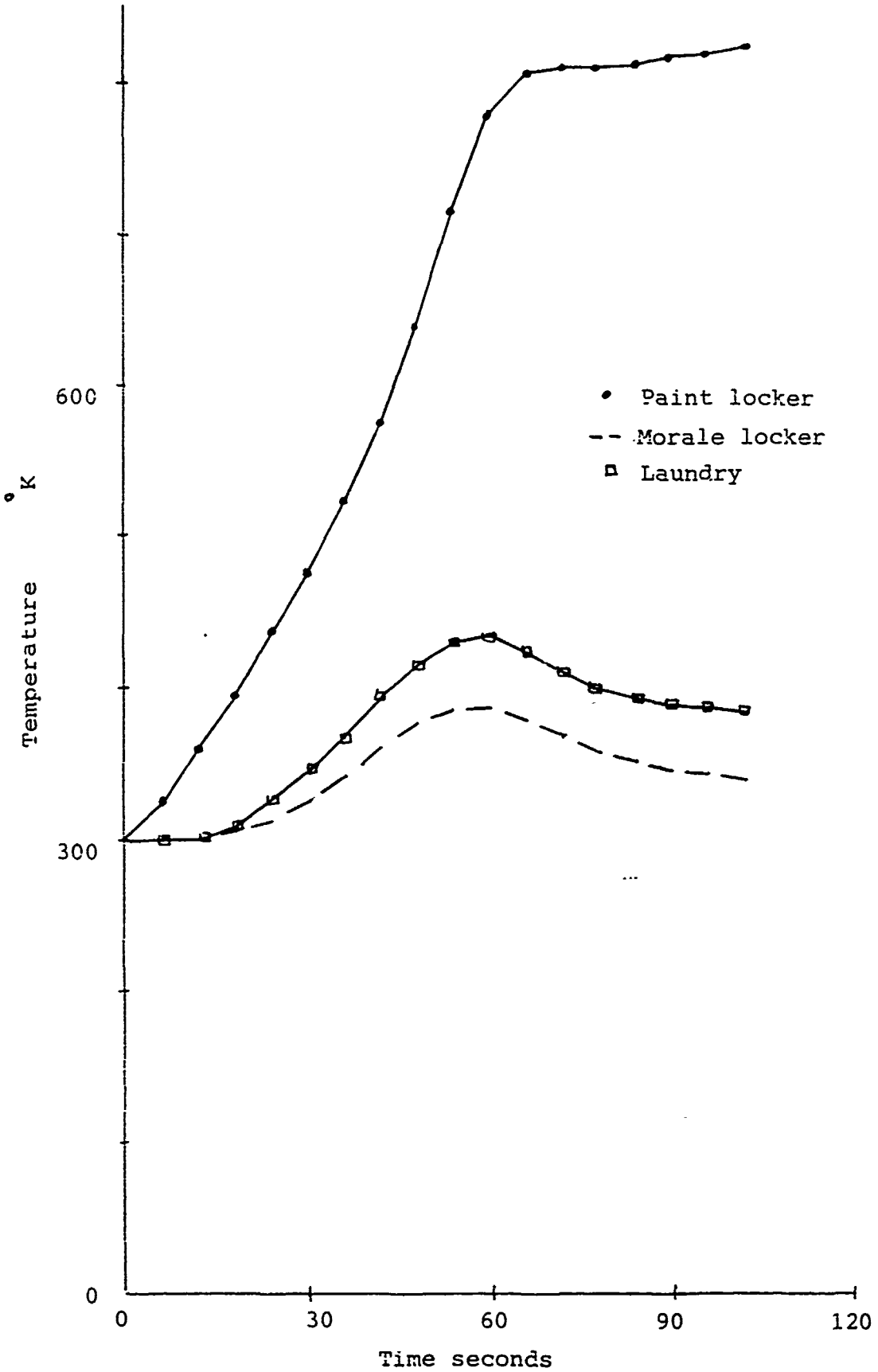


Fig.20 Temperature vs. time for Vigorous Paint Locker Burn

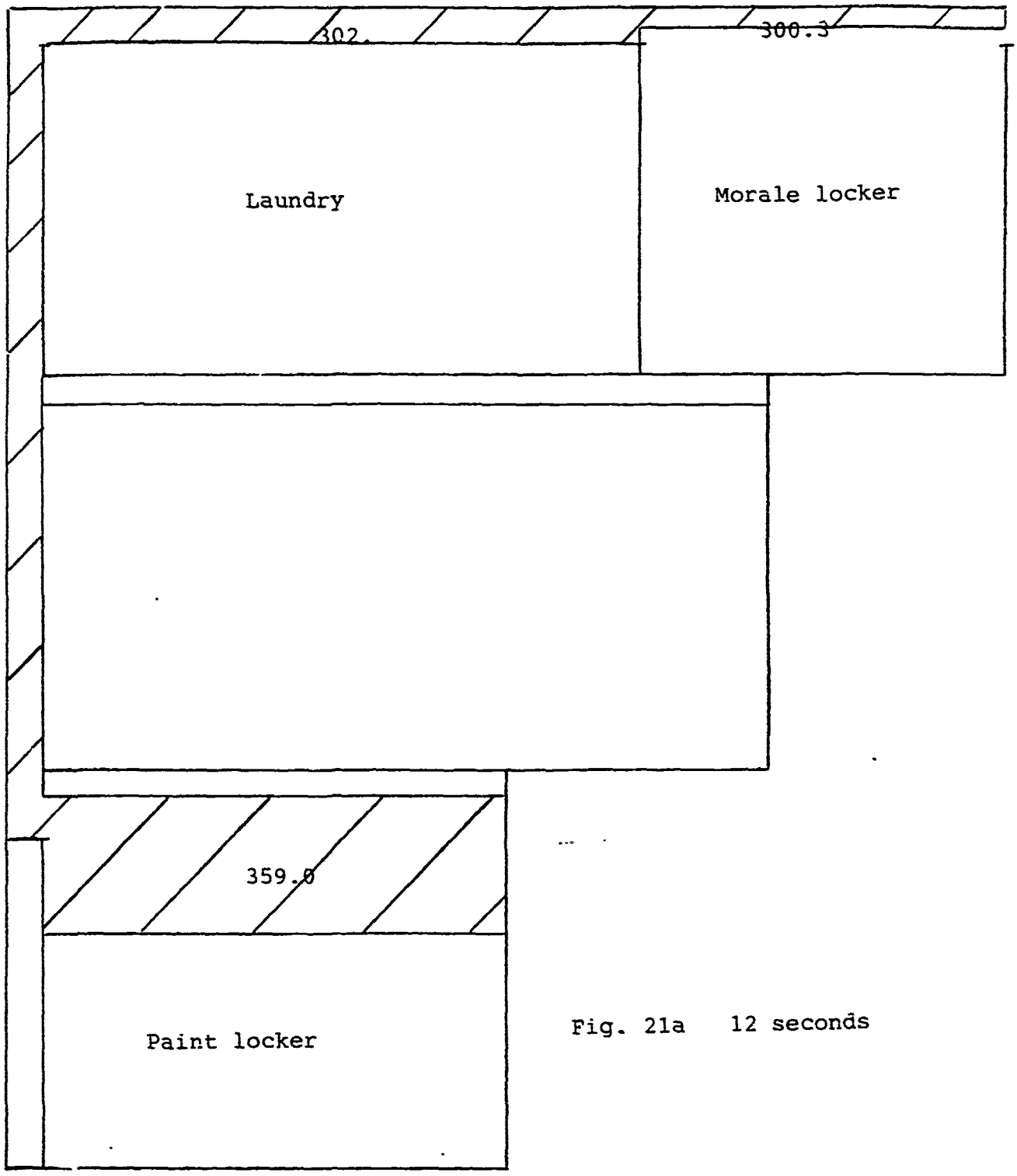


Fig. 21a 12 seconds

Fig. 21 (a–d) Smoke movement for Vigorous paint locker burn (elevation view)

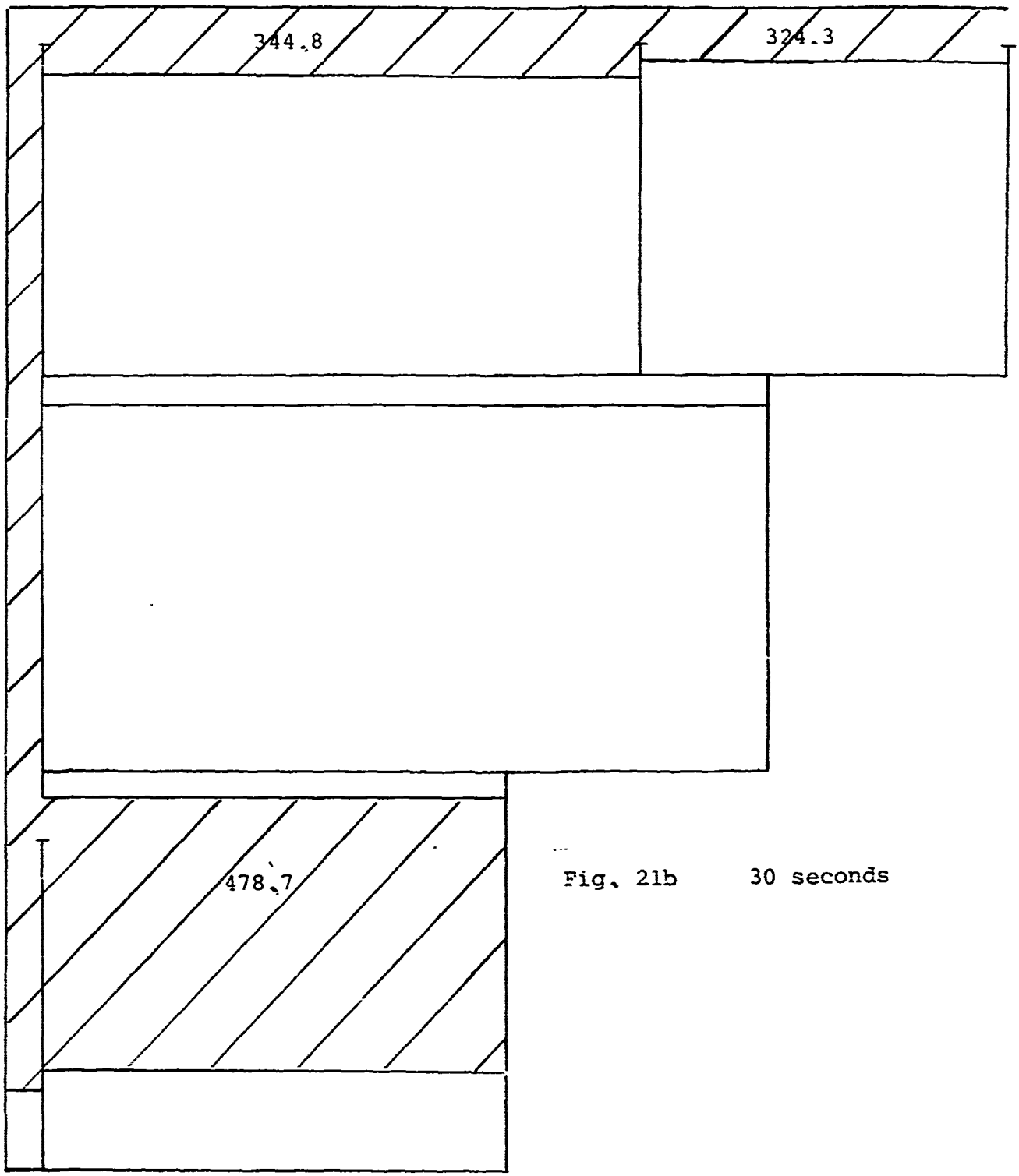


Fig. 21b 30 seconds

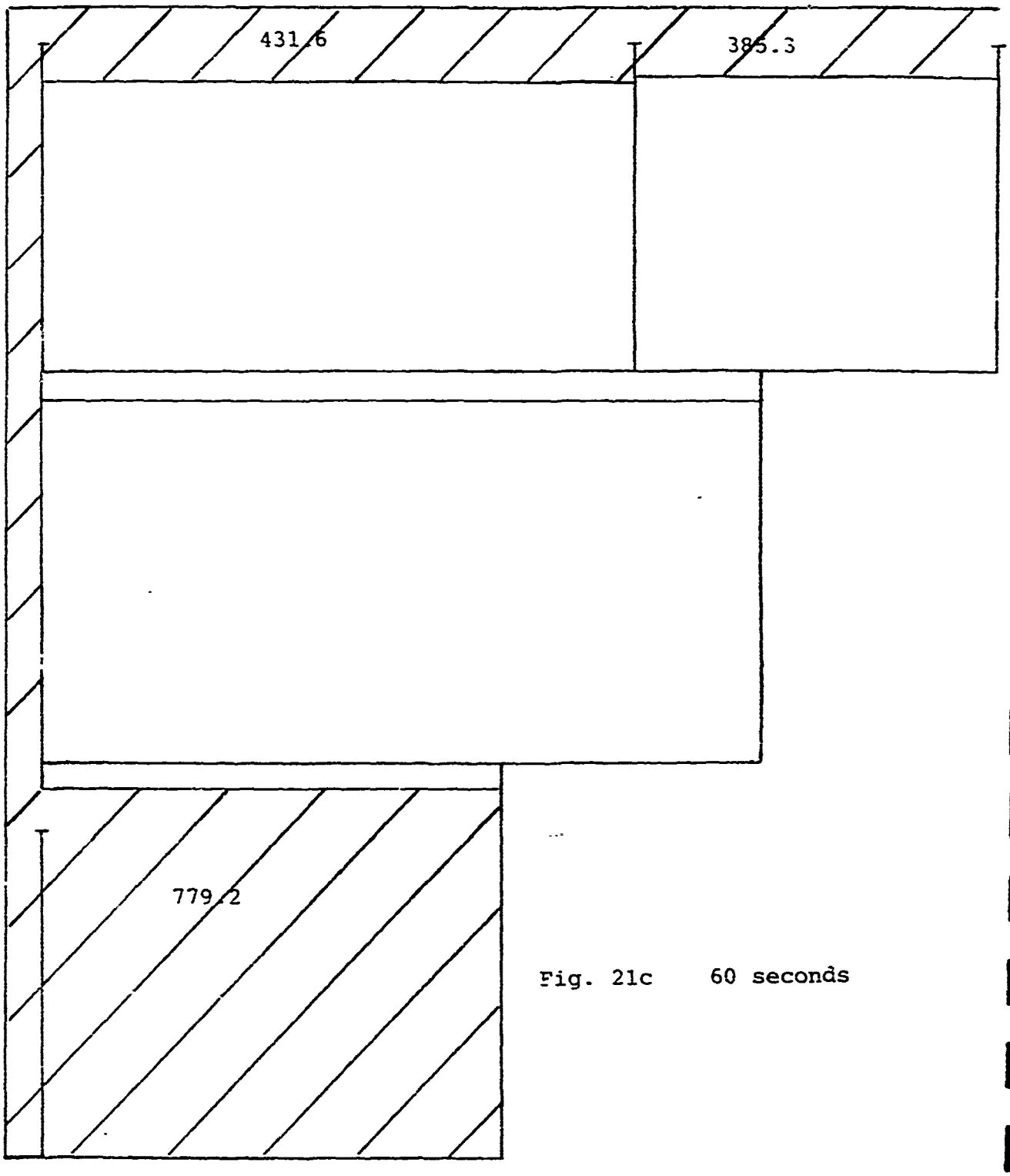


Fig. 21c 60 seconds

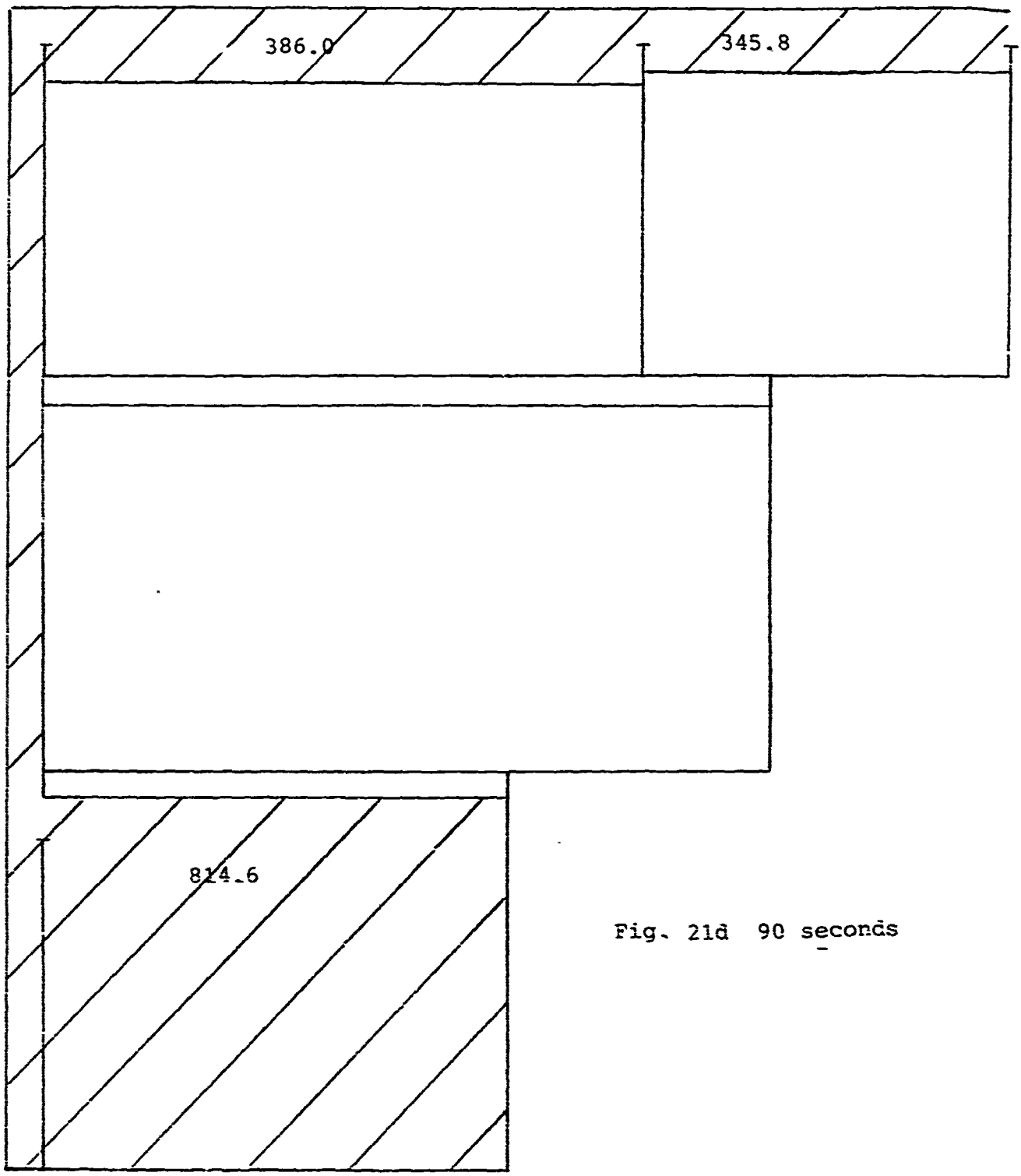


Fig. 21d 90 seconds

REFERENCES

1. Tanaka, T. "A Model of Multiroom Fire Spread," U.S. Dept. of Commerce, NBSIR 83-2718, 1983.

2. Helgeson, W.C. and H.E. Schultz, "A Method for Evaluating Smoke Control on Ships Using SF_6 Tracer Gas," U.S. Dept. of Transportation, U.S. COAST GUARD, 1983.

SUPPLEMENTARY

INFORMATION

AD-A204754

U.S. Department of Transportation
United States Coast Guard

Commanding Officer
U.S. Coast Guard
Marine Safety Laboratories

Marine Fire and Safety Research Division

Avery Point
Groton, CT 06340-6096
Phone: 203/441-2760

793308.52
5 June 1989

Defense Logistics Agency
Defense Technical Information Service
Cameron Station
Alexandria, VA 22314

Dear Sir:

The enclosed errata sheet indicates corrections needed in Report No. CG-M-04-88, "Fire Safety Analysis of the Polar Icebreaker Replacement Design," Volume II only. Please make the appropriate corrections.

If you have questions regarding these corrections, please contact me at (203)441-2760.

Sincerely,

R.C. Richards

R.C. RICHARDS
Chief, MF&SRD
By direction

Encl: (1) Errata Sheet

ERRATA SHEET

Errata sheet for report entitled:

"Fire Safety Analysis of the Polar Icebreaker Replacement Design"
Report No. CG-M-04-88
Performing Organization Report No. CG-MF&SRS-63
Volume II

Please update column labels on Appendix E, "Fire Hazards for Polar Icebreaker Replacement," as follows:

Class A Fuel: replace (psf) with (lbs/sq ft)
Class B Fuel: replace (gal) with (gals/sq ft)

Also, disregard the column labeled "Total Fuel" in Appendix H, "Pre-Flashover Data and FRI Time." The values listed in this appendix for Total Fuel are inaccurate and should be ignored. Appendix E accurately lists the fuel estimates for each compartment in lbs/sq ft and gal/sq ft. Volume III accurately lists the total fuel values for each compartment in BTU's/sq ft.