LIST FOR CHEMICAL AND BIOLOGICAL

EMERGENCY SPILL EQUIPMENT

(Recommended)

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PERSONAL PROTECTIVE EQUIPMENT

TYPE	NO	COMMENTS
Level A (Gas Tight)	8	Limited life suits preferred, but multi use suits acceptable if decontamination can be verified. Suits to have decontamination line fitted and have points for securing torches. No requirement for fire retardant material. Manufacture's include, Drager, Respirex, Trelleborg etc
Level B (Liquid Tight Suits)	8/16	Can be either limited life (Tyvek F) or multiuse. The important issue is that of compatibility. The suits must have sealable zips, hood and cuffs to ensure a liquid tight fit. Consideration should be given to the use of encapsulating suits (not gas tight) to protect the SCBA from contamination.
Level C Suits	8/16	These suits need to be able to protect the worker from accidental contact with the hazardous substance. A high resistance fabric such as those used for Level B would be recommended to ensure safety.
Level C Suits	24	Tyvek Pro-Tech or similar disposable suits to protect the worker in a low risk environment
Training Suits (Level A)	2	Recommended to protect the operational equipment.
Chemical Boots	8	Steel toe-capped chemical resistant boots, the industry standard is the Bata Hazmax range.
Safety Boots	8	As above but lower resistance to be worn with level C/D clothing
Overshoes	24	Chemical resistant overshoes such as Tyvek F to protect the expensive PPE and reduce contamination carryover

Chemical Cloves	24/24	A mixture of glove types to give maximum compatibility, good examples include Barrier and Nitrile. The manufacturer must be able to provide good information on material compatibility (See Ansell website)
Working Gloves	24	Leather Palmed for use over the chemical resistant gloves and general working.
Chemical Gloves	2	Cryogenic gloves for working with very cold temperatures, such as escaping gases.
Chemical Cloves	100	Disposable gloves for inner protection and casual use.
Full Face Visors	6	For wearing with hard hat and to protect against accidental splash contact.
Chemical Goggles	24	Gas tight goggles
Flame retardant clothing	6	
Head Protection	12	
Ear Protection	6	

RESPIRATORY EQUIPMENT

TYPE	NO	COMMENTS
SCBA with Cylinder	8	Self Contained Positive pressure breathing apparatus with cylinder. Carbon Fibre cylinders are available but need protection. It is considered at this time that steel cylinders would be preferable. Duration of 30mins min for each cylinder based on normal consumption. Sets to have Decontamination line. Give consideration to face masks with radio fitting capability to improve communications
Spare Cylinders	16	30mins duration per cylinder.
Airline Breathing Apparatus with cylinder	4	For use on an external airline or within the Level A Suits when working off an external air source.
Full Face Respirators	8	Canister or Cartridge variety compatible with organic and particulate filters
Organic Filters	16	Maximum resistance type is preferred.
Particulate Filters	8	HEPA type filters
BA Control Board	1	Stage 1 Breathing Apparatus control board for entry teams, with clock and user clips
Breathing Air Compressor	1	Portable unit or immediate access to a suitable device with the appropriate connections.
Industrial Air Compressor	1	85Cbm or higher for use with air driven pumps and Respiratory protection
Medical Filter unit	1	For use with the industrial compressor

Extension Airlines	8	50m lengths of anti static hose
Extension Airlines	4	3m lengths of anti static hose
Y Piece connection	2	For use with the above.
Air Resuscitation Equipment	1	For rescue purposes
Oxygen Resuscitation Equipment	1	For medical use in a non-hazardous area
Portable Trolley Breathing set	1	Complete set with cylinders for use with the compressor system or as an emergency back up for breathing systems.

DETECTION AND MONITORING EQUIPMENT

TYPE	NO	COMMENTS
Combustible gas meter	1	Either a stand alone unit or part of a multigas unit capable of detecting O2, H2S in addition
Oxygen Meter	1	See above
		Or in place of the above a multigas detector as below
Multi Gas detector	2	Capable of remotely sensing LEL, H2S, O2 and selected vapours.
Detection Tubes	1 Set	Drager tubes or similar to cover a range of chemicals appropriate to the location.
Photo- Ionisation detector	1	For the detection of Volatile organic compounds, useful when contaminant is not known. Used extensively by fire departments around the world.
PH detection	1	Either PH Papers or an automatic detector.
Personal Oxygen Detectors	4	To be worn by response personnel in confined spaces.

RESPONSE EQUIPMENT

TYPE	NO	COMMENTS
Chemical Pump	1	2.5inch Stainless Steel air driven diaphragm pump with PTFE or Teflon seals
Acid Pump	1	As above but of a plastic type material
Hand Pump	1	Stainless Steel for drum transfer.
Portable Hose	100m	PTFE lined hose for use with the air driven pumps. To be in max 10m lengths. Connections to be Stainless Steel
Earthing set	1	Cable, clips and earthing rods for securely earthing the pumping set-up
Salvage Drums	6	For 45 gal/ 220L Drums, Polythenene screw top
Overpack Drum	6	As above
Overpack Drum	6	Lined metal drums for storing waste.
Overpack Drums	4	30L poly screw top for waste in small quantities
IBC Tanks	2	1000L HDPE tanks for storing bulk waste or product, connections to be compatible with the 2.5inch pumps
45gal drums	6	Clean and empty 45 gallon drums of steel and/or HDPE construction for transferring substances
Neutraliser	6	Each of 25kg bags of Acid and Base Neutralizer, the ideal product will change colour on neutralizing the substance.
Container Sealant	2	Packs of putty suitable for temporary repair of a damaged container, examples include “Dammit and Plug-n-Dyke”
Sorbent Boom Large	10 Packs	Both Hydrocarbon and Chemical sorbents are required and a minimum stock of 6 is recommended for confinement and recovery operations. It is essential that replacement stocks can be obtained quickly.
Sorbent Boom Small	10 Packs	As above
Sorbent Pads	2 Packs	As above
Sorbent Rolls	1	As above

DECONTAMINATION EQUIPMENT- ACCESS CONTROL

TYPE	NO	COMMENTS
Wash down tank	1	Collapsible tank such as Vikoma Rapide for large scale washdown
Small tanks	3	Small capacity tanks (paddling pool) for individual washdown
Back pack Sprayer	2	For wash down of contaminated personnel and equipment
Pressure washer	1	Petrol or Diesel drive with lance for high pressure, low volume flushing
Buckets with lids (Large)	4	For disposal of large items
Buckets with Lids (Small)	12	For disposal of other items
Plastic Sheeting	1 Roll	Heavy duty lining such as Visqueen for lining the decontamination area and covering contaminated equipment
Tape/ Barriers/ Cones		Sufficient to control the site of operations.
Brushes/ Brooms		At least 12 to cover the operation
Decontamination Shower	1	These all encompassing showers can be purchased but generally require a large volume of water, this would be suitable on a vessel or in a port.

GENERAL EQUIPMENT

TYPE	NO	COMMENTS
Portable Generator	1	
EX Lighting	4	For illuminating the hazardous zone 500W
Non Ex Lighting	4	For illuminating the support zones 500W
Hand Lights	12	EX rated torches for use in a hazardous environment
Portable Radios	6	Ex rated for use in hazardous zones.
Wind Indicator	1	
Hand Tools	1	Spades, Picks, Shovels, Brooms, spanners, hammers etc
Sample Jars	12	Metal and Glass type for sample taking
Eye Wash Stations	2	
Fire Extinguisher	4	20lb Dry Powder
Fire Extinguisher	4	Foam
First Aid Kit	2	Suitable for Chemicals and Burns.
Binoculars	1	
Rope		For lowering and Lashing purposes

CAPITAL EQUIPMENT (SHARE BASIS)

TYPE	NO	COMMENTS
Salvage Pumps	2	Portable stainless steel salvage pumps with hydraulic drive, suggest Framo TK 80 type pump which is easy to handle
Power Packs	2	Power pack for the TK 80, suitable for use in a hazardous environment
Transfer hose	200m	4” transfer hose for use with TK 80
Reducers		A collection of reducers to enable the pump and hose to be used onboard vessels.

Training & personnel

It is recommended that a team of at least 10 trained personnel be available at all times, this can be achieved by pre-identifying a larger pool of personnel and providing the necessary training in equipment and operational procedures. It would be necessary to ensure that all personnel have at least 2 days familiarization per year on the equipment and operational procedures. This would involve theory and practical.

Transport

Consideration should be given to fitting out a dedicated command and control vehicle as an operations centre. General transportation needs can be addressed as required. This Command and Control vehicle can be used with any type of Marine Emergency.
