

Salvage Plan & Information Sheet

During the response to a marine casualty, the On Scene Coordinator (OSC) or Captain of the Port (COTP) may require a Salvage Plan. The OSC/COTP will evaluate this plan for its impact upon many issues including: (1) personnel safety (passengers, crew, & responders), (2) the environment, (3) waterways and shipping, (4) commercial facilities, (5) recreational areas, and (6) the overall response effort.

This list, compiled by the USCG Marine Safety Center (MSC) Salvage Team, is intended to assist those on scene in gathering the necessary information quickly and with minimal burden. The MSC Salvage Team, frequently reviews salvage plans on behalf of the OSC for technical, engineering issues. The symbols listed below indicate the relative importance of each particular piece of information to this technical analysis.

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- (V)- VITAL: Minimum information needed for meaningful technical analysis.
- (N) - NECESSARY: Enables reasonably accurate technical analysis in a relatively short amount of time.
- (P) - PREFERRED: Enables most rapid technical analysis with highest accuracy.
- (O) - Operational: Information not necessarily vital to performing salvage engineering analysis but may be important to salvage response.
-

Once the appropriate information has been collected, this list also serves as a guide for preparing the salvage plan to be submitted to the OSC/COTP. As the contents of this list are **not** applicable to every situation, the preparers of the salvage plan must use their own judgment in determining which elements to include.

Note: Some of the most important information during a salvage response is available well beforehand. Most of section C., except the Post Casualty section, may be completed before the vessel sails.

WARNING: This list is **not** intended to replace the expertise of a qualified Salvage Master, Salvage Engineer or Naval Architect. **Nor** is this list intended to incorporate all safety issues of a vessel salvage operation. Further, we recommend that vessel operators develop their own emergency check list to deal with the many critical initial actions by a vessel's crew. This list is offered as guidance for gathering information commonly requested by the Coast Guard when overseeing a salvage operation. More or different information may be required by the OSC due to particular circumstances.

Sources: Jamestown Marine Services Survey Form, U.S. Navy Salvage Manual,
Modern Marine Salvage (Milwee), USCG MSC Salvage Team

Salvage Plan/Information Sheet

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Salvage Overview Sheet

Send early as heads up on casualty

Vessel Name: _____

O.N. / Class ID.: _____ L: _____ B: _____ D: _____

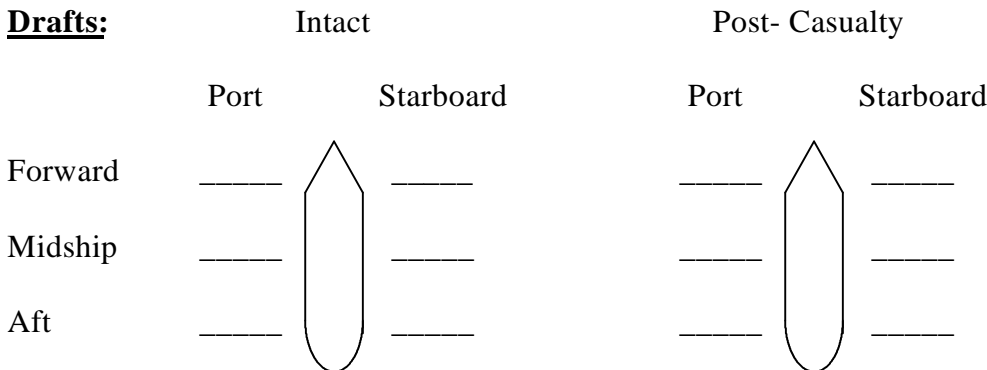
Ship Type _____

Type of Casualty: (Check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Fire
<input type="checkbox"/> Explosion
<input type="checkbox"/> Stranding (Grounding)
<input type="checkbox"/> Collision/Allision
<input type="checkbox"/> Structural Damage | <input type="checkbox"/> Flooding
<input type="checkbox"/> Sinking
<input type="checkbox"/> Capsizing
<input type="checkbox"/> Oil Spill/HAZMAT Release
<input type="checkbox"/> Other: _____ |
|--|---|

Reported Damage:

Drafts:



Available Stability Information

- Computer Model
 Trim & Stability Book
 Vessel Plans
 None

Available Structural Information:

- Computer Model
 Section Modulus
 Midship Section
 None

USCG MSC Salvage Team Salvage Plan/Information Sheet

A. General Information:

(O) Date/Time of Casualty: _____

(V) Type of Casualty: (Check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Fire (D.1.) | <input type="checkbox"/> Flooding (D.5.) |
| <input type="checkbox"/> Explosion (D.1.) | <input type="checkbox"/> Sinking (D.6.) |
| <input type="checkbox"/> Stranding (Grounding) (D.2.) | <input type="checkbox"/> Capsizing (D.7.) |
| <input type="checkbox"/> Collision/Allision (D.3.) | <input type="checkbox"/> Oil Spill/HAZMAT Release (D.8) |
| <input type="checkbox"/> Structural Damage (D.4.) | <input type="checkbox"/> Other: _____ |

(O) Location (area name): _____

(coordinates): _____

(O) Crew/ Passenger Status: _____

(O) Impact/Consequences:

	Has occurred?	Is likely to occur?	Significance Major /	
Minor				
Oil Spill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical Release	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Waterway Restricted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(O) Owner/ Rep.: _____ phone: _____

(O) QI / Local Contact: _____ phone: _____

(O) Salvage Master: _____ phone: _____

FAX: _____ pager: _____

B. Site Conditions:

(N) Casualty exposed to:

swell: _____ (height/period)

seas: _____ (height/period, breaking?)

wind: _____ (speed/direction)

currents: _____ (surface, speed/direction)

_____ (subsurface, speed/direction)

(O) Water Temperature: _____

(V) Vessel is in Fresh / Salt / Brackish Water? (Circle One)

- S.G. if known: _____

(O) Access:

To the wreck site: _____

To the wreck: _____

To beach/shore: _____

(O) Weather:

Current: _____

Forecast: _____

(O) Accurate large scale chart, recent edition, covering site available YES / NO
(Attach excerpts / copies)

(O) Area around casualty and channel to deep water sounded YES / NO
(Attach report)

C. Vessel Information: (Complete separately for each vessel of interest.)

(V) Vessel Name: _____

(N) O.N.: _____

(V) SHIP TYPE (pick one):

- | | | |
|---------------------------------------|--|---|
| <input type="checkbox"/> Bulk Carrier | <input type="checkbox"/> Product Carrier | <input type="checkbox"/> Ro-Ro |
| <input type="checkbox"/> LPG Carrier | <input type="checkbox"/> Tanker | <input type="checkbox"/> Barge Carrier |
| <input type="checkbox"/> LNG Carrier | <input type="checkbox"/> Break-Bulk | <input type="checkbox"/> Barge (w/ rake) |
| <input type="checkbox"/> OBO Carrier | <input type="checkbox"/> Cargo Liner | <input type="checkbox"/> Barge (w/o rake) |
| <input type="checkbox"/> Lumber Ship | <input type="checkbox"/> Containership | <input type="checkbox"/> Other: _____ |

(O) Flag _____ (N) Year Built: _____

(N) Builder & Hull No. _____

(N) Class Society _____ Class ID No. _____

(P) **Has a computer model of this vessel been prepared and is the program capable of damage stability and residual structural strength assessments?**

Yes No

(NOTE: Required for some tank vessels: 46 CFR 155.240)

If Yes...

- Format?: HECSALV, GHS, SCHP, Other

- Skip to part C.4., Initial Conditions, and contact the MSC Salvage Team for details on how to send the electronic model & data.

If No... complete sections C.1, C.2, and C.3, as appropriate.

C.1. Stability Information:

(P) Computer model: Available, Not Available, Attached, Sent
 - If available: HECSALV, GHS, SCHP, Other _____

OR...

(N) Trim & Stability Book Available, Not Available, Sent
 Loading Manual Available, Not Available, Sent
 Hydrostatics/Curves of Form Available, Not Available, Sent
 Capacity Plan Available, Not Available, Sent

OR...

(V) Lines Plans - Available, Not Available, Attached, Sent

And...
 General Arrangements (Compartmentation):
 Available, Not Available, Attached, Sent

And...
 Lightship Weight & Center of Gravity - LCG _____
 (from stability letter?) VCG _____
 TCG _____
 Displacement _____

OR...

(N) Onboard Loading Computer:
 Available? YES / NO
 Type: (e.g.: Cargomax) _____

Output: Drafts Intact Stability
 Shear Stress Damaged Stability
 Bending Moment Grounding Analysis

OR...

If little or no stability information available **Go to Section C.3**

C.2. Structural Information (Note: generally must do stability analysis first)

(P) Computer model: Available, Not Available, Attached, Sent

- If available: HECSALV, GHS, SCHP, Other _____

OR...

(N) Plans for structural sections at midship & cargo area

Available, Not Available, Attached, Sent

OR...

(N) Onboard Loading Computer:

Available? YES/NO

Type: (e.g.: Cargomax) _____

Output: Drafts Intact Stability
 Shear Stress Damaged Stability
 Bending Moment Grounding Analysis

OR...

(N) If little or no structural information available...

Class Society Rules of Hull Design: _____
(e.g.: ABS Rules for Steel Vessels, 1987)

Required Midship Section Modulus: _____

C.3. Ad Hoc Model Parameters:

(For building an approximate model when information is lacking.)

(V) LBP (Length Between Perpendiculars) _____ (ft , M)

(V) Beam (Molded) _____ (ft , M)

(V) Depth (Molded) _____ (ft , M)

(V) Service Speed _____(knots)

(V) Mean Draft (Full Load) _____(ft , M)

(V) Trim (Full Load) _____(ft , M)

(V) Stern Type: Transom

Cruiser

(V) No. of Screws _____

Displacements:

(V) Normal Service Drafts: _____FWD (ft / M) _____AFT (ft / M)

(V) Lightship: Displacement _____(Long Tons / Tonnes)

or... Drafts: _____FWD (ft / M) _____AFT (ft / M)

(V) Full Load: Displacement _____(Long Tons / Tonnes)

or... Drafts: _____FWD (ft / M) _____AFT (ft / M)

(V) Deadweight: _____(Long Tons / Tonnes)

(N) C_b (Block Coef.) _____

(N) C_w (Waterplane Coef.) _____

(N) C_p (Prismatic Coef.) _____

(N) C_m (Midship Coef.) _____

(N) TPI _____ (at normal displacement)

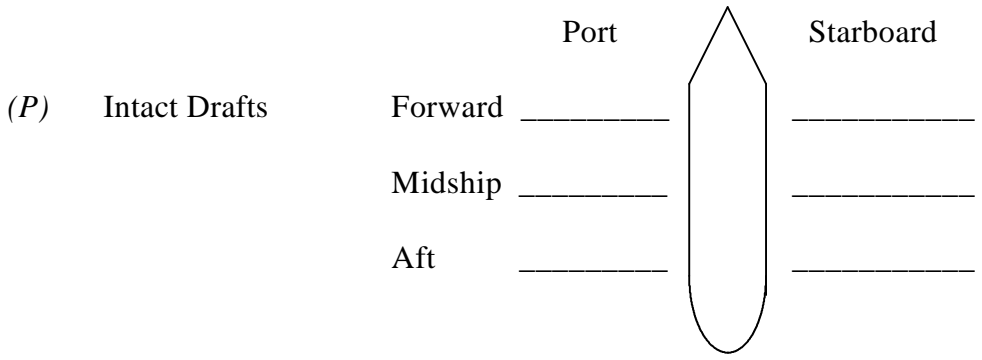
C.3. Ad Hoc Model Parameters:(continued)

(N) MT1cm _____ (at normal displacement)

(N) House Location: Aft, ¾ Aft, MS, FWD

(N) Engine Room: Aft, ¾ Aft, MS

C.4. Initial Conditions:



When taken?: Shortly before casualty / departure conditions? _____

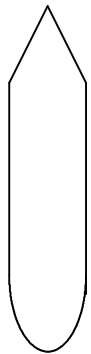
- (V) Departure Loading (Cargo, Fuel, & Ballast)
 - with names & specific gravities of cargo & fuel
 - with estimates. of consumed fuel, stores, etc.

Available, Not Available, Attached, Sent
 (For sample Cargo Detailed Loading Description, see section C.6.)

OR...

(N) Loading Summary:	Yes/No	BBLs or Tons
Solid Cargo:	<input type="checkbox"/> / <input type="checkbox"/>	_____
Liquid Cargo:	<input type="checkbox"/> / <input type="checkbox"/>	_____
Fuel:	<input type="checkbox"/> / <input type="checkbox"/>	_____
Lube Oil:	<input type="checkbox"/> / <input type="checkbox"/>	_____
Feed Water:	<input type="checkbox"/> / <input type="checkbox"/>	_____
Potable Water:	<input type="checkbox"/> / <input type="checkbox"/>	_____
Water Ballast:	<input type="checkbox"/> / <input type="checkbox"/>	_____
Permanent Ballast:	<input type="checkbox"/> / <input type="checkbox"/>	_____
Ammunition/Explosives:	<input type="checkbox"/> / <input type="checkbox"/>	_____

C.5. Post Casualty Conditions :

		Port		Starboard
(V)	Post Casualty Drafts	Forward	_____	_____
		Midship	_____	_____
		Aft	_____	_____
	Time taken? _____			

(V) Post casualty loading (Cargo, Fuel, & Ballast)

Available, Not Available, Attached, Sent

(For sample Cargo Detailed Loading Description, see section C.6.)

OR...

(N)	Loading Summary:	Yes/No	BBLs or Tons
	Solid Cargo:	<input type="checkbox"/> / <input type="checkbox"/>	_____
	Liquid Cargo:	<input type="checkbox"/> / <input type="checkbox"/>	_____
	Fuel:	<input type="checkbox"/> / <input type="checkbox"/>	_____
	Lube Oil:	<input type="checkbox"/> / <input type="checkbox"/>	_____
	Feed Water:	<input type="checkbox"/> / <input type="checkbox"/>	_____
	Potable Water:	<input type="checkbox"/> / <input type="checkbox"/>	_____
	Water Ballast:	<input type="checkbox"/> / <input type="checkbox"/>	_____
	Permanent Ballast:	<input type="checkbox"/> / <input type="checkbox"/>	_____
	Ammunition/Explosives:	<input type="checkbox"/> / <input type="checkbox"/>	_____

(O) Internal survey performed? YES / NO (If yes, attach results of survey)

(O) Dive survey performed? YES / NO (If yes, attach results of survey)

C.5. Post Casualty Conditions:(continued)

(O) Engineering Plant Status:

Main Propulsion _____

Electrical: _____

Maneuvering & Control: _____

C.6. Cargo Detailed Loading Description:

Tank Name	Type of Cargo	BBLs	API/ Specific Vol.	Temp.	Inerted (Y/N)
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

C.7. Cargo Pumping, Piping, and Venting Description

(O) Transfer system: Piped, Free Flow or Combination

(O) Installed cargo pumps (enter number at right):

Pumproom _____

Independent cargo tank pumps _____ Inside Tank / Outside Tank

(O) Cargo Piping:

Common header

Independent

Combined Describe or attach drawing: _____

(O) Ventilation system:

Open or closed vent system? _____

Common or independent vents? _____

PV's set at what pressure/vacuum? _____ / _____

(O) IGS:

Type: Flue Gas Exhaust / Inert Gas Generator / Nitrogen / Other _____

List pressure & O2 in each tank: (Attach)

(P) Automatic Tank Gauging System Yes / No

- Operable in all tanks? Yes / No

(List tanks where inoperable & describe sounding technique.)

D.1. Fire/Explosion:

(V) Where is the fire?

Location: Deck(s), Compartment(s), etc.

Compartment dimensions?

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

(V) How much fire fighting water has been pumped onto the vessel? _____

OR....

# Pumps		Discharge Rate (GPM)		minutes in use		Gallons
_____	X	_____	X	_____	=	_____
_____	X	_____	X	_____	=	_____
_____	X	_____	X	_____	=	_____
_____	X	_____	X	_____	=	_____
_____	X	_____	X	_____	=	_____
_____	X	_____	X	_____	=	_____

TOTAL: _____ Gallons

D.1. Fire/Explosion:(continued)

(V) **Stability analysis** for considering application of fire fighting water:

Available, Not Available, Attached, Sent

(V) How long have they been fighting the fire? _____

(V) Intensity? (describe) _____

(V) **Structural analysis** for consideration of weakening of structure due to long or intense fire. See D.4 also.

Available, Not Available, Attached, Sent

(O) What kind of fire is/was it?

Class A - Combustibles

Class B - Liquid - What liquid(s): _____ (attach list)

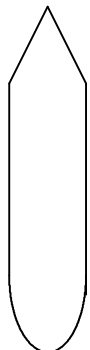
Class C - Electrical

Class D - Metals

(N) Fire fighting agent(s) used? _____

See Section E to identify salvage methods & operations.

D.2. Stranding (Grounding):

		Port		Starboard
(V)	Post Casualty Drafts	Forward	_____	_____
		Midship	_____	_____
		Aft	_____	_____

(N) Tide height/Time when above drafts taken _____ / _____

(N) Tidal data: Time:_____ Height: _____
 Time:_____ Height: _____
 Time:_____ Height: _____
 Time:_____ Height: _____
 Time:_____ Height: _____

(P) Location of ground contact with hull (attach drawing or description)

Available, Not Available, Attached, Sent

(P) Soundings:

Distance from bow	Port	Starboard
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(P) Post Grounding Tank & Void Soundings.

Available, Not Available, Attached, Sent

(P) Speed prior to stranding? _____ KTS

D.2. Stranding (Grounding)(continued)

(P) Course at time of stranding? _____° True / Magnetic

(P) Position of rudder at time of stranding _____

(V) Bottom:

Material: Mud / Silt, Sand, Coral, Rock Other _____

Slope: _____

Topography: _____

(O) Current Effects:

Scouring? _____

Silting/sand buildup? _____

(O) **Stability Analysis at LOW TIDE**

Available, Not Available, Attached, Sent

(O) **Structural Analysis at LOW TIDE**

Available, Not Available, Attached, Sent

(O) **Stability Analysis after vessel is free floating**

Available, Not Available, Attached, Sent

(O) **Structural Analysis after vessel is free floating**

Available, Not Available, Attached, Sent

See Section E to identify salvage methods & operations.

D.3. Collision/Allision:

(V) How many vessels are involved? _____

(V) Description of damage to each vessel involved: (Attach)

(V) If collision, are vessels still connected? YES / NO

If Yes:

(V) **Stability** analysis for vessels **while connected:**

Available, Not Available, Attached, Sent

(V) **Structural** analysis for vessels **while connected:**

Available, Not Available, Attached, Sent

(V) If allision, is vessel still connected to fixed structure? YES / NO

If Yes:

(V) **Stability** analysis for vessel **while connected:**

Available, Not Available, Attached, Sent

(V) **Structural** analysis for vessel **while connected:**

Available, Not Available, Attached, Sent

For **Any** collision or allision:

(V) **Stability** analysis for each vessel **after separation**

Available, Not Available, Attached, Sent

(V) **Structural** analysis for each vessel **after separation:**

Available, Not Available, Attached, Sent

See Section E to identify salvage methods & operations.

D.4. Structural Failure/Damage:(Ensure Section C.2 is completed.)

(V) General description of damage - attach drawing or written description.

- Location (by spaces, frames, height above keel, etc.)
- Dimensions

Available, Not Available, Attached, Sent

(V) External Damage: (attach drawing or written description)

Describe general position/attitude of damage with respect to significant features of ship (particular bulkheads, tanks, draft marks, coamings, etc.)

Available, Not Available, Attached, Sent

(V) Internal Damage: (attach drawing or written description)

Describe general position/attitude of damage with respect to significant features of ship (particular bulkheads, tanks, draft marks, coamings, etc.)

Available, Not Available, Attached, Sent

(P) Which structural members are damaged?

(V) Cracks? - Yes / No/ Unknown (Circle One)

- Location/ Length? (attach description)
- Propagating? Yes / No/Unknown (Circle One)

(V) General structural integrity? Corrosion? (attach description)

(V) **Structural analysis based upon residual hull strength**

Available, Not Available, Attached, Sent

See Section E to identify salvage methods & operations.

D.5. Flooding/Breach of Watertight Integrity(continued)

(V) Where is water coming in? _____

(V) Progressive? (Yes / No)

(V) Is source of flooding a hole or fracture?YES / NO

If **YES**, see section D3.

(V) Cargo accounted for? (Yes / No)

(V) Oil in water? (Yes/ No)

(O) Method(s) to be used to dewater:

- Pumping (See E.3.)
- Blowing (See E.4)
- Other: _____

(V) **Stability analysis**with for consideration of **flooding**& for **each phase of dewatering**

- Available,
- Not Available,
- Attached,
- Sent

See Section E to identify salvage methods & operations.

D.6. Sinking:

- (V) Is vessel a possible source of pollution from oil or hazardous material **YES / NO**
- (V) If **Yes**, where is the oil or hazardous material located and how is it stored: (attach list/dwg.)
(e.g.: 1000 bbl. bunker tank, starboard side of E/R in integral tank.)
- (V) Measures taken to mitigate pollution threat?
- (V) **Stability** analysis for vessels **while submerged**.
(Is vessel sufficiently stable to ensure safe salvage operations) :
 Available, Not Available, Attached, Sent
- (V) **Structural** analysis for each vessel **while submerged**
(Is vessel likely to break up in current situation) :
 Available, Not Available, Attached, Sent
- (V) **Structural** analysis for vessels **during raising** (including slicing prevention):
 Available, Not Available, Attached, Sent
- (V) **Stability** analysis for each vessel **during raising** (including means to prevent capsizing):
 Available, Not Available, Attached, Sent

See Section E to identify salvage methods & operations.

D.7. Capsizing:

(V) Vessel orientation/attitude (Attach drawing or picture):

- Height of Forward end above water: _____

Describe reference point: (keel, etc) _____

- Height of Aft end above water: _____

Describe reference point: (rudder, shaft, etc.) _____

Is any part of the vessel touching bottom?

Forward Aft Other: _____

Unknown

(V) Describe motions of vessel: _____

Lively? YES / NO

Is the vessel rolling? YES / NO

If Yes, what is roll period? _____ (seconds)

(V) What is known about the status of on board weights?

Lost cargo?, Containers? _____

Equipment?, Machinery? _____

Compartments flooded? _____

(V) **Stability** analysis of capsized hull to prevent **unexpected righting**

Available, Not Available, Attached, Sent

D.7. Capsizing (continued)

(V) Describe proposed method to right vessel: _____

(V) **Stability** analysis of vessel on **righted**:

Available, Not Available, Attached, Sent

See Section E to identify salvage methods & operations.

D.8. Oil Spill/Hazardous Material Release:

(V) Is source of pollution (oil spill/release) under control? YES / NO:

(V) Describe source of pollution from vessel (Attach drawing or picture):

(V) Describe measures to reduce or eliminate source of pollution from vessel:

If the measures above involve the moving of cargo, ballast, or other weights...

(V) **Structural** analysis for impact of action taken to control the source of pollution:

- Available, Not Available, Attached, Sent

(V) **Stability** analysis for impact of action taken to control the source of pollution:

- Available, Not Available, Attached, Sent

See Section E to identify salvage methods & operations.

E. Salvage methods & operations(check all that apply)

- Lightering /Transfer (See Section E.1)
- Pulling/Beach Gear (See Section E.2)
- Pumping (See Section E.3)
- Blowing/Compressed Air (See Section E.4)
- Lifting (See Section E.5)
- Patching/Temporary Repairs (See Section E.6)
- Afloat Towing (See Section E.7)
- Transit (See Section E.8)
- Other: _____

E.1. Lightering/Internal Transfer:

(V) Lightering plan:

- Available, Not Available, Attached, Sent

This plan should include:

(P) **Stability Analysis** for each phase of the lightering evolution:

- Available, Not Available, Attached, Sent

(P) **Structural Analysis** for each phase of the lightering evolution:

- Available, Not Available, Attached, Sent

(V) Description, amount, initial and final location of cargo transferred: (attach)

(O) Describe mooring arrangements of vessels involved in lightering arrangement (attach)

(O) Is there a possibility that the ship may rise to uncover hidden damage YES / NO

If **YES** then discuss measures to control pollution,

(O) Describe resources be in place to control the vessel once it is free floating:

E.2. Pulling/Beach Gear:

(V) Ground Reaction (Attach Calculations): _____

(V) Force to Free (Attach Calculations): _____

(V) Available Towing Capacity:

Towing Vessel Name	SHP	Bollard Pull
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(V) Tow wire information (type, size, safe working load):

(O) Attach diagram of operation: (Vessel locations, anchor points, etc.)

E.3. Pumping:

(O) Type of pumps to be used: (submersible electric, reciprocating air, centrifugal, etc.)

(O) Pump Access: (through butterworth openings, tank dome, etc.)

(O) Tanks to be inerted during pumping? YES / NO

(O) Is cargo a static accumulator? YES / NO

If **YES** then discuss measures to prevent static discharge:

(O) Installed pumps or piping system to be used to move cargo? YES / NO

If **YES** then discuss measures taken to ensure system is still operating safely.

(O) Are the pumproom bilges free of large accumulations of flammable/combustible liquids? YES / NO

(O) Is the pumproom ventilation system operating properly? YES / NO

E.4. Blowing/Compressed Air

(V) Maximum pressure to be used: _____

(Provide quantitative analysis for all pressures above 5 psi,.)

(V) Means to control air pressure: _____

(P) Location of space to be pressed up, including vertical dimensions: _____

(P) Height of water in space WRT waterline. _____

(V) Measures taken to accommodate air expansion as vessel is raised:

(V) **Stability** analysis for vessel **while compartment pressed up.**

Available, Not Available, Attached, Sent

(V) **Structural** analysis for each vessel **while compartment pressed up.**

Available, Not Available, Attached, Sent

(V) Standby measures if air pressure in compartment is lost: _____

(V) **Stability** analysis for vessel if **air pressure is lost.**

Available, Not Available, Attached, Sent

(V) **Structural** analysis for vessel if **air pressure is lost.**

Available, Not Available, Attached, Sent

E.5. Lifting Operations:

(P) Description of Straps/Wire rope? _____

(P) Number of straps to be used? _____

(P) Location of straps with respect to vessels length. (attach drawing)

(V) Hull form in way of straps:

- Bilge Radius _____

- Use of bolsters, protection of bilge keels, keelsons etc. (attach drawings/description)

(V) **Structural**analysis to consider **lifting forces** (including slicing prevention):

Available, Not Available, Attached, Sent

(V) Is external floatation to be used (pontoons, air bags, etc.) YES / NO

If **YES**, then describe location and buoyancy provided.

Structuralanalysis to consider **lifting forces** (including slicing prevention):

Available, Not Available, Attached, Sent

E.6. Patching/Temporary Hull Repairs:

(V) Purpose of patch/repair:

- Restore watertight integrity
- Structural continuity
- Prevent damage from spreading (i.e. stop crack propagation)
- Contain pollution threat
- Permit Gas Freeing Operations
- Other: _____

(V) Qualitative analysis to show that patch/repair is adequate for intended purpose and vessel route & service:

- Available, Not Available, Attached, Sent

E.7. Afloat Towing:

(V) Quantitative analysis to show towing vessel has adequate pulling capacity for anticipated weather, seaway, & distance.:

Available, Not Available, Attached, Sent

E.8. Transit:

(O) Destination: _____

(O) Route: _____

(O) Estimated Time/Date of arrival: _____

(O) Maximum/Minimum Speed: _____

(O) Weather Forecast: _____

(O) Purpose of Transit (Offload, Repair, etc.): _____