RAPID RESPONSE DAMAGE ASSESSMENT
MOBILE OFFSHORE DRILLING UNITS

ABS Plaza
16855 Northchase Drive, Houston, TX 77060 USA
Tel: 1-281-877-6000 Fax: 1-281-877-5964
Email: rrda@eagle.org
Website: www.eagle.org

TABLE OF CONTENTS

SECTION

1 RRDA Program

1.1 General

The ABS Rapid Response Damage Assessment (RRDA) Program is administered from the ABS Headquarters in Houston, Texas, USA. RRDA provides support during an emergency incident affecting an enrolled unit's stability **when afloat and residual strength (for ship shaped units)**.

The ABS RRDA team is activated when authorized contact is made through direct verbal communication at the 24-hour emergency number requesting assistance. The time from the initial activation of the ABS RRDA team and the provision of specific damaged stability and strength guidance is dependent on:

- Receipt of unit information such as loading conditions and onsite damage assessment.
- Criticality of the situation.
- The complexity of the problem.

When requested by a flag Administration, ABS is obliged to provide details of its evaluations and files. When a unit is classed or issued with a Load Line by ABS, the ABS Classification department will be advised that the RRDA team is evaluating damage on an ABS-classed or Load Line-only unit. The RRDA team will communicate response activity to the ABS Classification department for consideration however, survey by a class surveyor continues to be a requirement for subsequent evaluation of damage and repairs or when a Certificate of Fitness to Proceed is to be issued.

1.2 Enrollment

RRDA enrollment is initiated by filling out and submitting the RRDA Enrollment Request Form. To obtain the form for any future enrolments please contact RRDA at rrda@eagle.org. One form should be completed for each unit and submitted to the above address. Once the request has been received the RRDA Agreement will be returned and the enrollment process will commence.

To complete the enrollment process RRDA compiles all documentation and creates all necessary models prior to the unit entering the RRDA program. The documentation is gathered into a single location and stored as a hard copy as well as electronically. The documentation required to complete the enrollment is as follows:

- Trim and Stability Manual
- Loading Manual
- Total lightship including weight, LCG, VCG and TCG
- Lightship, distribution for ships, subcomponents for self-elevating units
- Allowable values for Bending Moment and Shear Force for ships
- Deck loading limits
- General Arrangement Plan
- Capacity Plan
- Watertight Integrity Plan
- Midship Section, Shell Expansion, Construction Profile, Fore End Construction, Aft End Construction and Engine Room Construction for ships
- Structural drawings as applicable for non-ships
- Stability Analysis including Damage Stability
- Profile drawings and dimensions of superstructures

All documentation collected by or provided to RRDA is to have been reviewed and approved by the unit's Class Society. For ABS classed units RRDA will collect the documentation with help of the ABS engineering review office. In the event that documentation is not available the client will be notified and enrollment will be placed on hold until sufficient information is provided. For units not classed by ABS all documentation will need to be provided by the client to RRDA.

RRDA will proceed with creation of the stability model and structural model where applicable. The models are created in sufficient detail to enable stability assessment of all damage scenarios. The structural model is created to allow for assessment of residual strength of ship-shaped units and vessels.

Once the documentation gathering and model creation is finished the enrollment process is complete and RRDA certificate will be sent to the client. The certificate indicates that the unit is actively enrolled in the ABS RRDA program. RRDA must be contacted with any changes that permanently affects the unit's stability and strength where applicable.

1.3 Client Obligations

The client has a continuing obligation to notify ABS of all changes, additions, and deletions from or to the structure, materials, machinery, and equipment of the unit. If required, the Lightship Adjustment Record kept by the unit operator is to be provided to RRDA in event of a response. The client must notify RRDA in writing when the RRDA service agreement is to be terminated.

1.4 Types of Response Analyses

Rapid Response Damage Assessment consists of the following tasks, as appropriate:

- Calculation and verification of initial loading condition prior to incident.
- Calculation of afloat residual stability, evaluation of compartment flooding effect on stability after damage.
- Evaluation of possible flooding scenarios due to progressive flooding or additional damage.
- Calculation of wind environmental force on the unit and evaluation of the impact on the unit.
- Evaluation of plans for offloading, ballasting or weight transfer sequences to improve residual stability and strength.
- Calculation of residual strength of ship shaped units following structural damage;
- Evaluation of residual strength for one way trip to safe location and/or repair facility (applies to drillships).
- Calculation of ground reaction force.
- Calculation of the bending moment and shear stresses from grounding for drillships.
- Evaluation of plans for refloating;
- Jackup hulls exposed to storm conditions while in the water (RPD, broken chords)
- Semis or jackup hulls grounded after hurricanes
- Other calculations as appropriate for the circumstances and conditions.

1.5 Drills

It is recommended that RRDA is included in drill or exercise activity. This builds respective relationships, creates a learning environment and aligns expectations. Contact the program manager at: rrda@eagle.org, to arrange a drill.

1.6 Service Limitations

ABS does not act as a principal in the matter of salvage or repairs. ABS can only act in an advisory capacity, leaving it always to the client to accept or reject recommendations ABS may make. ABS has no authority to order or contract for repairs, salvage or other matters. The RRDA Program does not cover salvage engineering, class surveys, or surveys in connection with repairs, damages,

conversions, compliance with outstanding recommendations, extensions, lay-up or reactivation, modifications/alterations, riding ship, change of flag or new installations.

SECTION

2

Activating/Notifying RRDA Team

2.1 Activating/Notifying RRDA Team

To activate the RRDA team, the client is to establish verbal communication.

24-hour Emergency Numbers (Houston, Texas, USA)

Primary: USA +281-872-6161
Alternate: USA +713-935-2886

Notes:

- **Do not wait to collect all information before calling. Initiate contact immediately and provide additional information when it is available.**
- **Always establish verbal communication first. The RRDA team will mobilize as information is being collected. RRDA fax and email are manned during normal office hours only therefore direct verbal communication should always be established to initiate the RRDA response.**

2.2 Action after Voice Notification

All inquiries, requests or information made or provided verbally during the telephone conversation are to be followed up in hard copy. The initial report and information is to be sent by email or fax to:

Email: rrda@eagle.org
Fax: USA +281-877-5964

2.3 Office Hours

The normal office hours are as listed below. During these normal office hours, a member of the ABS RRDA team can be expected to answer the primary emergency telephone. If personnel are temporarily unavailable, the line will automatically transfer to the answering service that will assist the caller until the response personnel can be contacted.

- Monday through Friday 7:30 a.m. to 5:30 p.m. (0730 to 1730) – Central US Time

2.4 After Office Hours

After office hours and holidays, the call will be answered by the ABS RRDA answering service. The caller will be asked for a contact name, unit's name, call back number and location. The caller will be asked if he or she wishes to be transferred directly to one of the RRDA personnel. If the caller does not

have time and wants to be called back, the answering service will locate a team member who will call back as soon as possible. Every effort is made to maintain a response time of less than 30 minutes. In the unlikely event that a call back is not received within 30 minutes, the original call should be repeated.

2.5 Stand Down

The ABS RRDA is to be notified in writing or by telephone when the service is no longer required and the response team is to stand down. ABS RRDA may also be placed on stand-by in anticipation of further action.

SECTION

3

Procedure for Reporting Incident

Primary: USA +281-872-6161
Alternate: USA +713-935-2886

3.1 Condition before the Incident

The initial notification of an incident is of primary importance. A simple verbal notification that there has been an incident will help the response team make preparations in case it is needed.

Once the initial verbal report is made, it remains important to follow up with additional information by phone or in writing as it becomes available. The main details about the incident should be provided and may include:

- Nature of the incident. (Collision, flooding, shifting of weights, grounding, explosion, firefighting etc.) and extent of damage to the unit.
- Location, date and time of incident.
- Best contact number to the unit.
- Best contact number to unit's shoreside emergency management personnel.
- Draft or freeboard readings (locations of readings).
- What is the water depth?
- Environmental conditions.
- Distribution of variable and fixed loads including liquid densities.
- Position of all cranes and any other moving equipment.
- Position of drilling derrick, machinery and equipment for drilling including, drilling loads exerted on the unit and riser loads as applicable.
- Mooring loads as applicable.
- Operational state of propulsion. Availability of towing vessels.
- Status (open/closed) of watertight doors and any other closing appliances.
- Position and length of all legs for Self-Elevating units.
- Is the unit elevated, floating or partially floating? As applicable.

3.1.1 Loaded Condition

It is important to provide the unit's load condition prior to the incident and the corresponding draft readings for that load condition when afloat. This may be in the form of the existing loading plan or use of the form *REPORT 1: Condition before Incident* in Appendix 1. Output from the on board loading computer if fitted, is preferred. This information is important for validation of the RRDA computer model at the onset of an incident.

Notes:

The HECSALV model created by RRDA details compartments, volumes and hydrostatics in the same way that a loading computer on board does. The RRDA model has been calibrated with the Approved Trim and Stability Book for the unit to ensure that the results obtained in Hecsalv are similar or the same. Therefore, the load computer on board and RRDA's model of the unit are expected to generate similar results for any given normal afloat load condition. The distinction between the RRDA's program is that HECSALV has capacity to complete other detailed analyses not usually found on a loading computer such as opening compartment to flooding, oil outflow calculations for breached tanks and reactions when the unit is unintentionally grounded. (Such as might occur during transit)

Load distribution of any weights not considered Lightship is complex and to communicate that to RRDA by hand written form is not an efficient use of personnel or time. Therefore, RRDA expects to receive this vital information as a copy of output from the rig's loading computer. This information is highly critical for RRDA and proper analyses cannot be made without it. Report 1 is a generic approach and may guide accordingly. RRDA will also need the density or API for tank contents including P-tanks.

3.2 Collision

The details of the collision are to be reported, using *REPORT 2: Collision Report* in Appendix 1 or by other means. Information may include;

- Report any known or suspected damage below the waterline. Include any tanks or other compartments that are observed to be flooding. Provide suspected source of flooding, such as hull damage, internal bulkhead or piping damage.
- Provide draft readings and angles for list and trim. Specify the location of drafts mark used to take the readings (unit's side, leg wells or column side). Record draft at regular intervals and report any change.
- Provide a list of all known damaged compartments, noting whether the flooding is from the sea or from other tanks.
- Sound all tanks and voids at regular intervals and report any differences from the initial loading condition. Report any liquid levels (increase or decrease). If the levels are increasing or decreasing try to establish the rate of change by sounding the tanks at defined intervals.
- Provide the name and type of vessel that hit the unit including its draft if available. This is used to assist in determining damage scenarios (particularly under water).
- Location of the collided vessel. Are the hulls separated?
- Provide details associated with the structural integrity or stability of the unit.
- Provide wind velocity and direction, sea state and other relevant weather conditions.
- Provide names and type of attending support vessels.

For Drillship
- Mooring system arrangement prior to the incident and current status with mooring loads.
- Status of thrusters. Have thrusters or thruster rooms been damaged?
- Status for moonpool structure and derrick foundations.

For Self-Elevating
- Leg position in the guides and TOC position below hull.
- Report any damage to hull, spudcans and/or legs.
- Status of the drilling package with respect to capacity for skidding.

For Column-Stabilized

- Mooring system arrangement prior to the incident and current status with mooring loads.
- Status of thrusters. Have thrusters or thruster rooms been damaged?
- Location of damage about pontoons, braces, columns, etc.

3.3 Grounding

The details of the grounding are to be reported using *REPORT 3: Grounding Report* in Appendix 1 or other means. Information may include;

- Exact location by latitude and longitude and/or distance and direction from known landmark.
- Heading and note if heading changes or remains constant. Provide a sketch of vessel's location relative to the channel or other known bottom features or landmarks.
- Tide data including times and heights for at least the next 72 hours and include the tide information at the time of the grounding. (RRDA maintains access to tidal data but will require verification from the unit).
- Estimate portion of hull believed to be aground with reference to frames and estimated distances from centerline or side (diver reports).
- Information on the type of bottom, if possible (e.g., sand, sediment, rock, mud).
- Record information at regular intervals noting the time and the height of the tide for each set of data as follows:
  - Drafts on both sides of the unit at the bow, amidships and aft. Alternatively, measure freeboards along each side.
  - Take soundings of water depths around the unit including forward, aft and several on each side (or as appropriate to the situation).
  - Record vessel heel and note changes. This is used as data to determine/confirm bottom location.
  - Provide diver's underwater survey of grounding contact and class damage survey report.
  - Provide photos for perspective and additional reporting if available.

For Drillship

- Status on thrusters after grounding. Have any thrusters been sheared off or damaged and are the remaining thrusters operational.

For Self-Elevating

- Leg position in the guides and TOC position.
- Report any damage to spudcans and/or legs. Status of jacking system.
- Status of the drilling package with respect to capacity for skidding.

For Column-Stabilized

- Status on thrusters after grounding. Have any thrusters been sheared off or damaged and are the remaining thrusters operational.
- Status of mooring lines and anchors.
- Damage to pontoons or appurtenances (e.g., hydrophones).

3.4 Lightering

The details of lightering the unit is to be reported using *REPORT 4: Lightering Plan* in Appendix 1 or other means. Information may include;

- Tidal data for a grounding event (RRDA maintains access to tidal data but will require verification from the unit)
- Describe all draft limitations imposed by the channel that may be pertinent to the lightering plan

- Approximate rate at which loads will be discharged.
- Estimated lightering plan start times and pumping sequence for ballast and other fluids.

APPENDIX

1

Sample Forms

Report 1: Condition before Incident
Report 2: Collision Report
Report 3: Grounding Report
Report 4: Lightering Plan
Sketches: For Referencing Related Information

REPORT 1:
Condition before Incident

GENERAL INFORMATION

Rig Name _____

IMO Number _____

Contact Name _____

Telephone _____

Email _____

Owner/Manager _____

Contact Name _____

Telephone _____

Email _____

PRIOR TO CASUALTY INFORMATION

Departure Port _____ (if applicable) Date _____

Destination _____ (if applicable)

Drafts

	Port	Center	Starboard	Comment
Forward				
Amidships				
Aft				
Heel Angle				**Degrees Port or Stb'd**
Trim Angle				**Degrees For'd or Aft**

Specific gravity of water at above draft condition: _____ (Mt/m³)

NOTE: RRDA's software program is arranged to mirror the Trim and Stability book for names and locations of variable weights. ***It is preferred that you send the "pdf" or other copy of output from the load computer or spreadsheet by email to "rrda@eagle.org".*** *You may also use the summaries as follows, depending on the way the data is arranged. Call RRDA if problems arise. RRDA will work the problem with you to ensure the unit's load condition data is understood and applied to the RRDA software correctly.*

Load Group:					
Name	**Weight (Mt)**	**L.C.G.**	**T.C.G.**	**V.C.G.**	
Total					

REPORT 2:
Collision Report

Type of casualty: (collision/grounding/fire/explosion/severe weather/ice/other)

Date _____ Time _____(Local/GMT)

Location Latitude _____

Longitude _____

Geographical Location _____

Name and IMO# of vessel in Collision _____

Weather Wind _____Knts.

Wave _____(m or ft)

Water Depth _____

Forecast _____

Drafts

	Port	Center	Starboard	Comment
Forward				
Amidships				
Aft				
Heel Angle				**Degrees Port or Stb'd**
Trim Angle				**Degrees For'd or Aft**

General description for cause of the damage. _____

Compartments breached to open water _____

Compartments opened to other compartments _____

Structural damage location with length, height and depth extremes _____

List any actions that have already been taken _____

What actions are proposed? _____

Note: Submitted photos should include descriptions of locations and extent of damages.

REPORT 3:
Grounding Report

Date _____ Time _____ (Local/GMT)

Location

Latitude _____

Longitude _____

Geographical Location _____

Time of grounding _____ (Local/GMT)

Environmental Conditions

Wind _____ Knts.

Wave _____ (m or ft)

Tide Data If Known

Range _____ (m or ft)

Level at time of incident _____ (m or ft)

Estimate at grounding _____ (m or ft)

Type of bottom at grounding point ❒ sand ❒ sediment ❒ rock ❒ mud

Weather Forecast _____

Drafts

	Port	Center	Starboard	Comment
Forward				
Amidships				
Aft				
Heel Angle				**Degrees Port or Stb'd**
Trim Angle				**Degrees For'd or Aft**
Time Drafts Taken				**Very Important**

Estimated Ground Contact Points (Use the Sketches Provided)

Aft Longitude Contact Point	_____ (m or ft) from (MS or AP)
Forward Longitude Contact Point	_____ (m or ft) from (MS or AP)
Transverse Extent	_____ (m or ft)

REPORT 4:

Lightering Plan

Date _____ Time _____ (Local/GMT)

Tidal Information if unit is Aground
RRDA maintains tidal data but may not have accurate data for the incident location. Provide the tidal data if requested.

Estimated time that lightering will commence _____ (Local/GMT)

Estimate total time required to unload the rig _____ (Local/GMT)

Planned order for unloading tubular, bulk, sacks, fluids and stores

	Items for Discharge	Weight	Location
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Salvage Company

Name of Company _____

Telephone _____

Email _____

Are there any other limitations or information useful to RRDA?

_____

_____

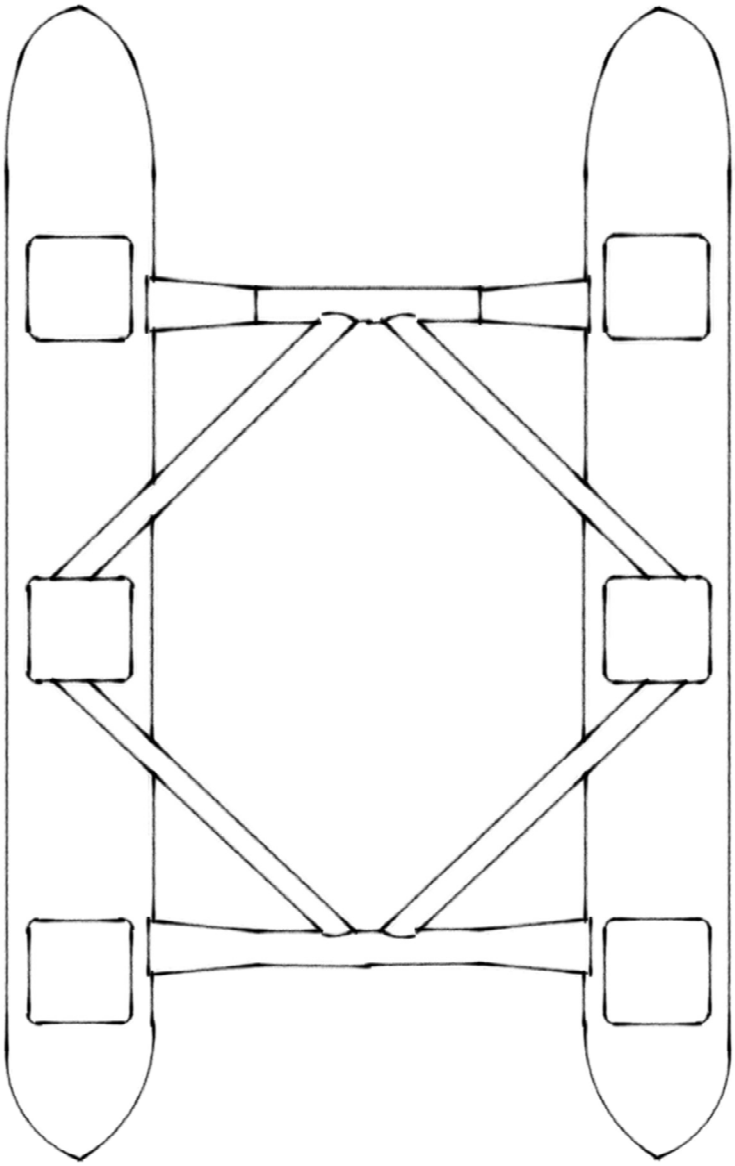
_____

_____

_____

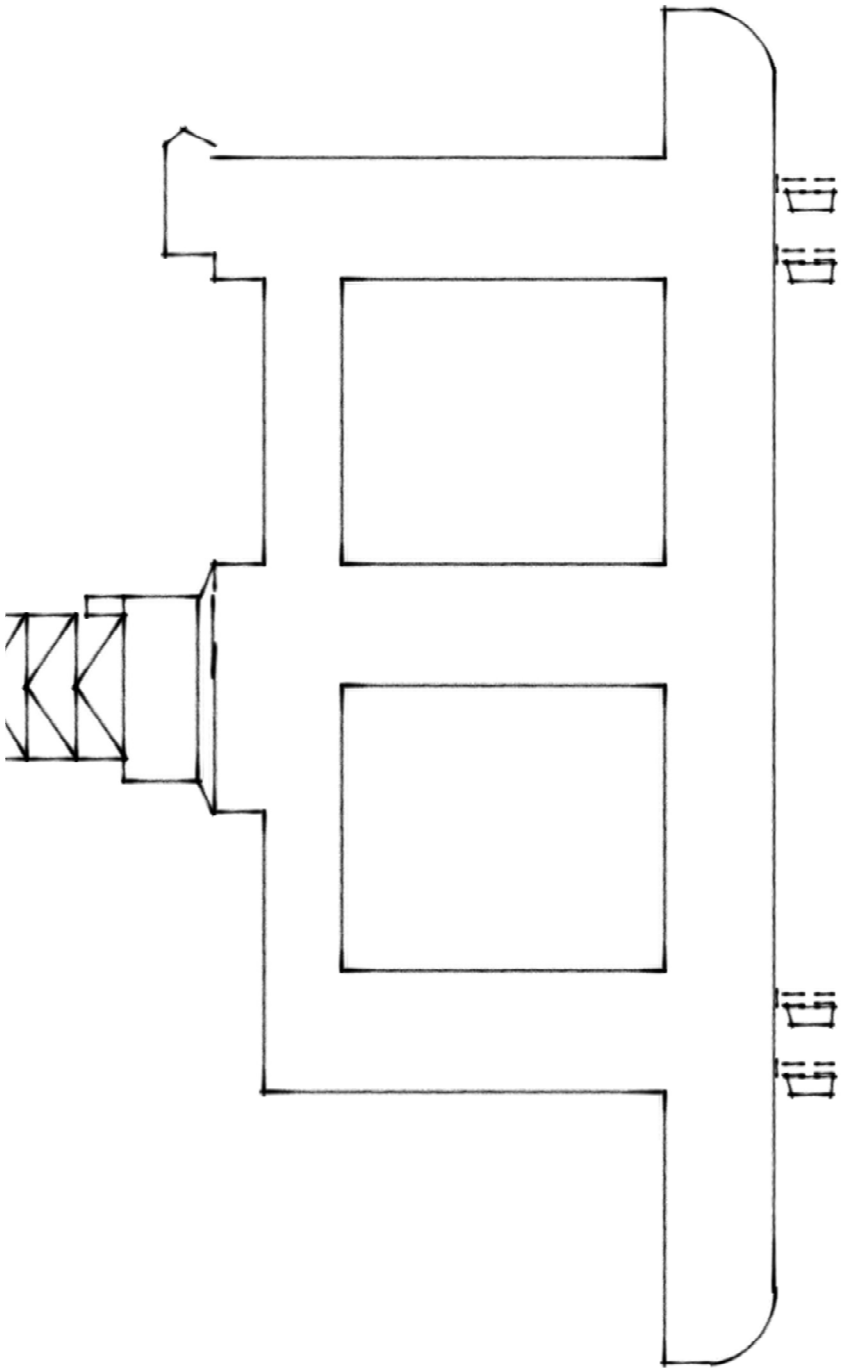
Sketch – For Referencing Related Information

Column Stabilized



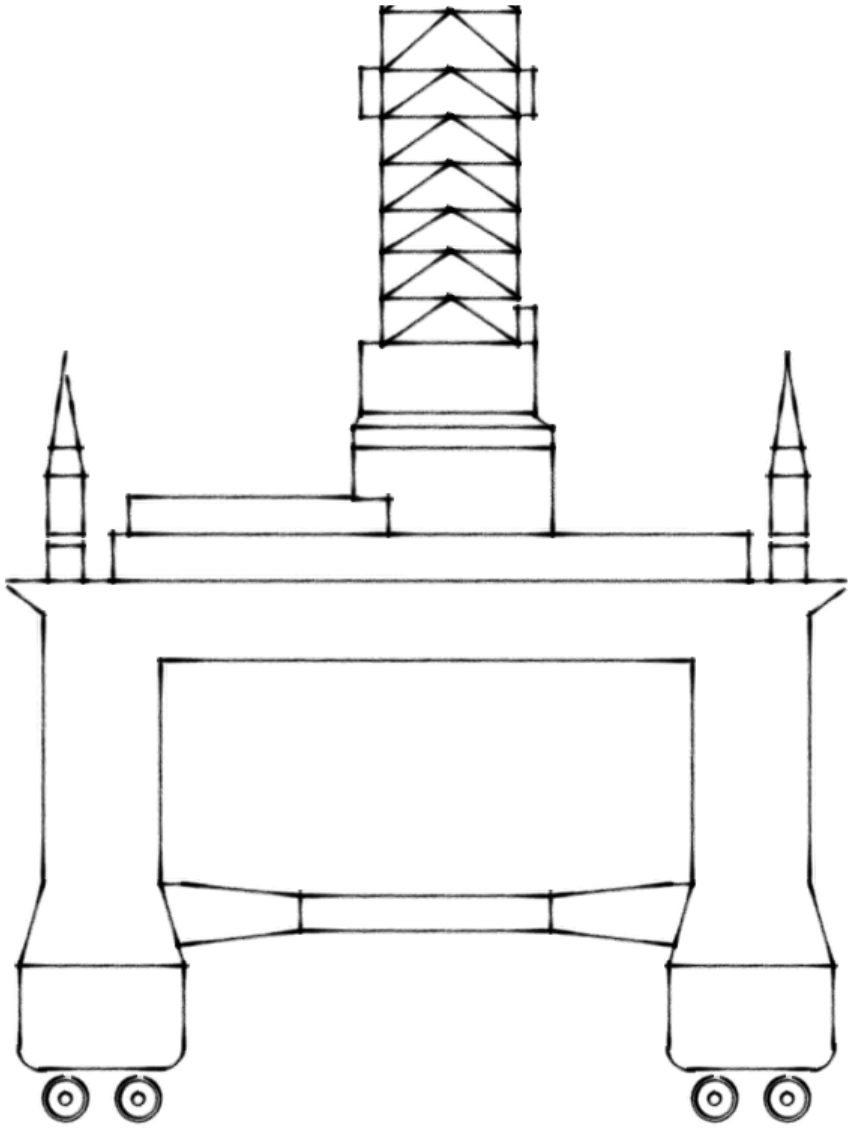
Sketch – For Referencing Related Information

Column Stabilized



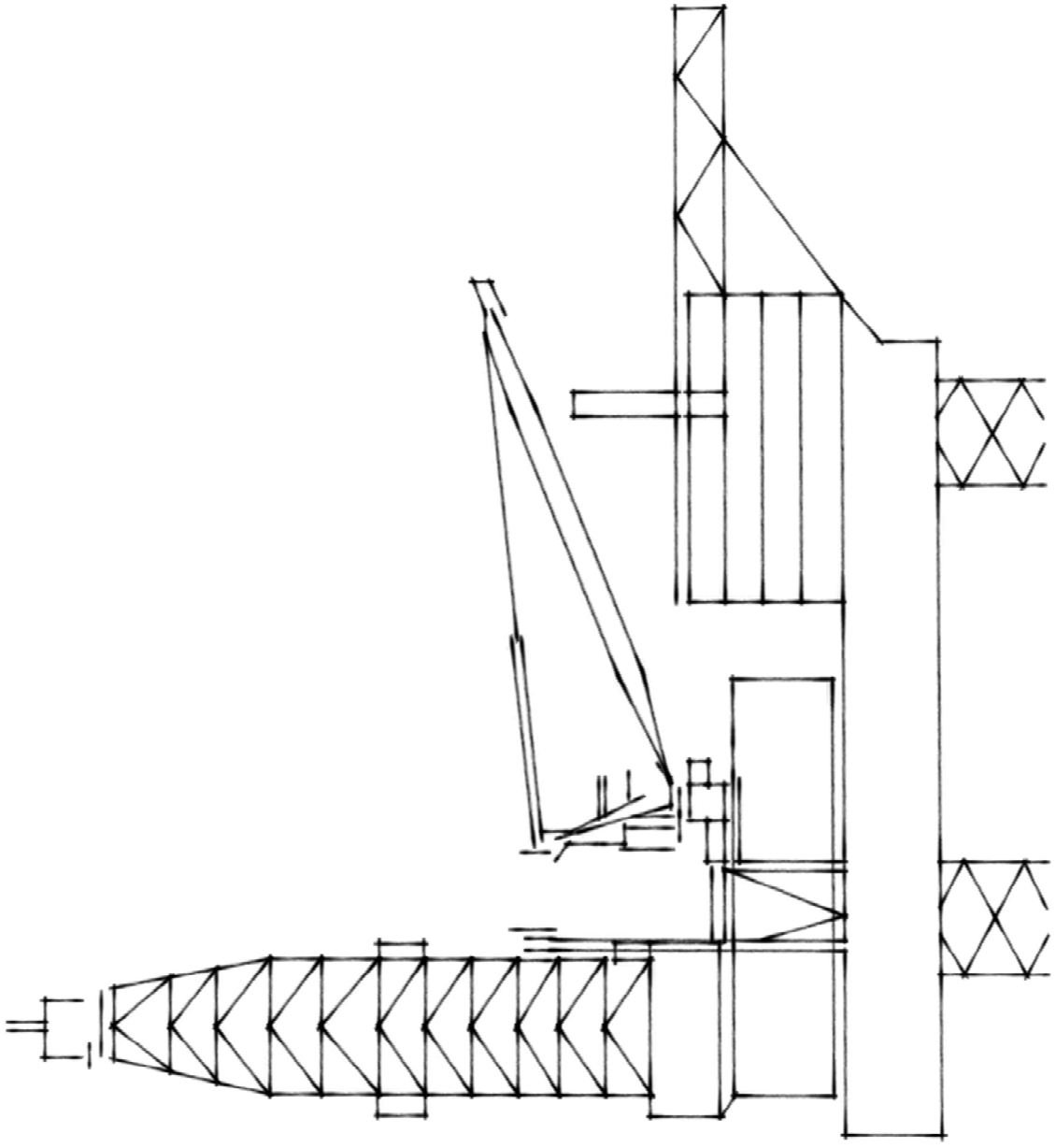
Sketch – For Referencing Related Information

Column Stabilized



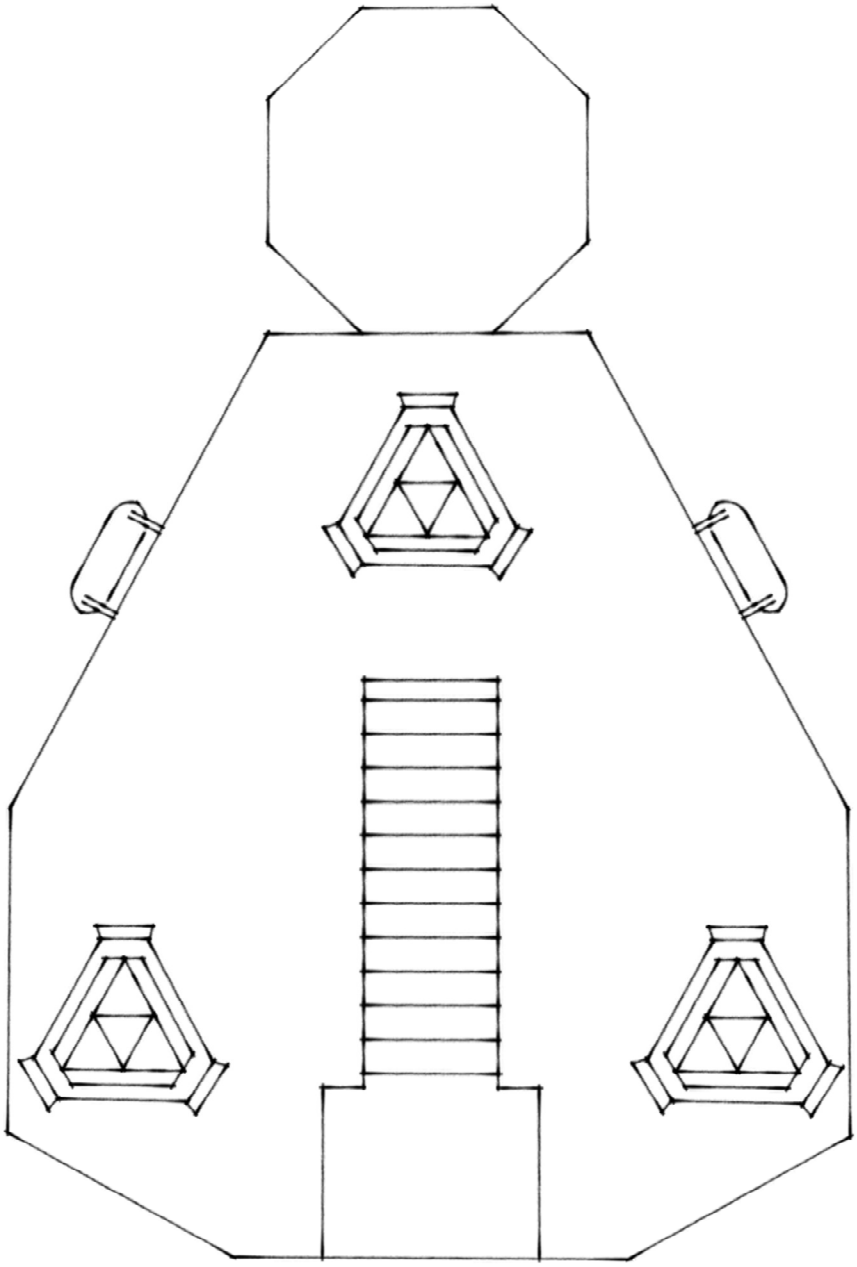
Sketch – For Referencing Related Information

Self-Elevating



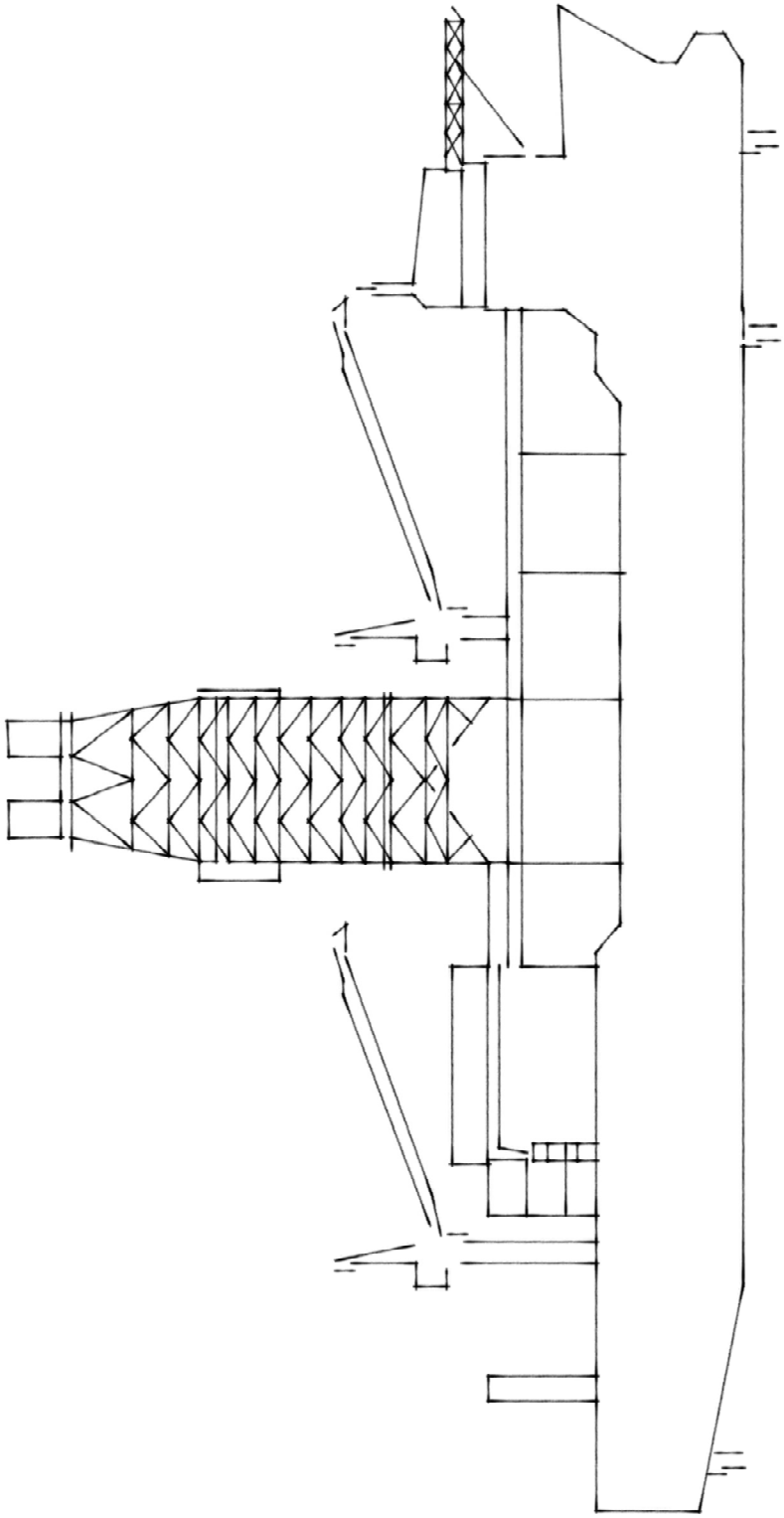
Sketch – For Referencing Related Information

Self-Elevating



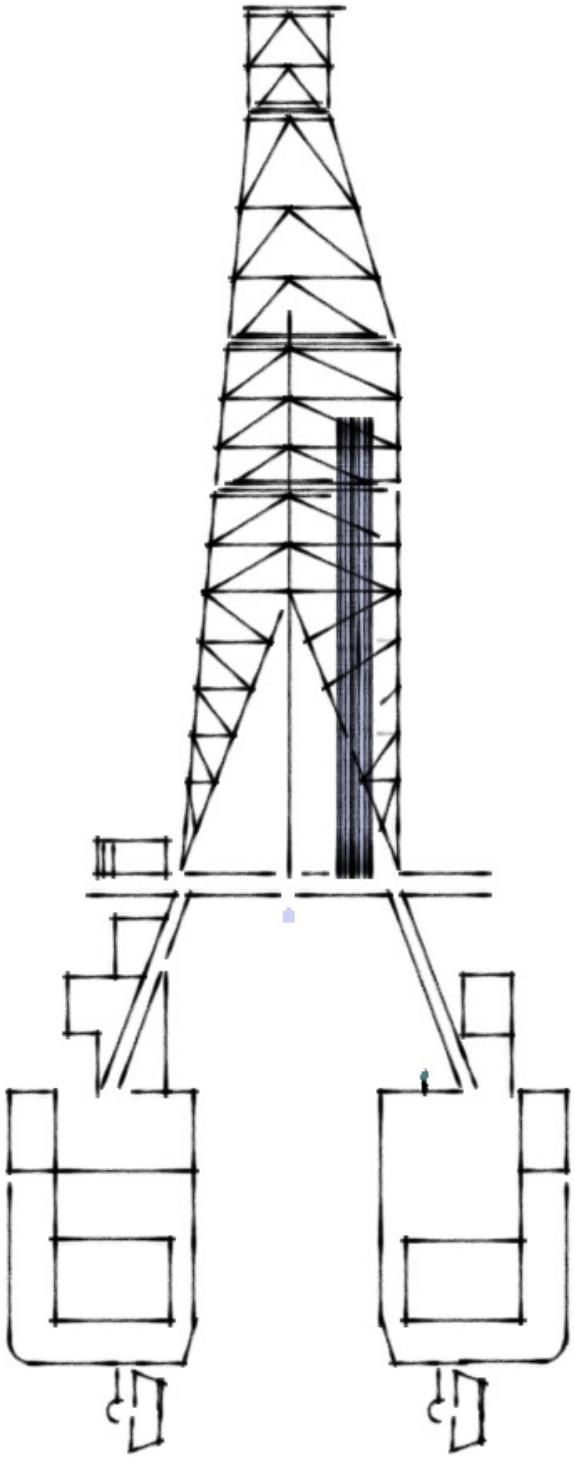
Sketch – For Referencing Related Information

Drillship



Sketch – For Referencing Related Information

Drillship



Sketch – For Referencing Related Information

Drillship