Site Inspection of Ship Recycling Facilities in India

February 2016
Ship Recycling Team, ClassNK

Ⓒ Copyright by NIPPON KAIJI KYOKAI
Contents

✓ Process of Issuance of SOC*
✓ Requirements of IMO Guidelines
  • Facility Management
  • Facility Operation
  • Worker Safety and Health Compliance Approach
  • Environmental Compliance Approach
✓ Conclusion
✓ Annex: Information on Alang

*SOC: Statement of Compliance
Process of Issuance of SOC
Process of Issuance of SOC

1. Examination of Ship Recycling Facility Plan (SRFP)
   Check that the procedures written in SRFP comply with HKC based on IMO Guidelines

2. Site Inspection
   Site Inspection is carried out by ClassNK surveyors to check that the procedures written in SRFP are actually taken place in the facility by interview, document check and site observation.

3. Issuance of SOC
   After successful completion of examination of SRFP and site inspection, ClassNK issues Statement of Compliance (SOC) to the SRF.
The Hong Kong Convention* (HKC) was adopted on 15 May 2009

* The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009
Requirements of HKC for SRFs

Ship Recycling Facilities are required to comply with the following regulations of HKC taking into account the guidelines developed by IMO.

- Ship Recycling Facility Plan (Reg. 18)
- Prevention of adverse effects to human health and the environment (Reg. 19)
  - Safe for entry, Safe for hot work, Prevent spills and emission, etc.
- Safe and environmentally sound management of Hazardous Materials (Reg. 20)
- Emergency preparedness and response (Reg. 21)
- Worker safety and training (Reg. 22)
  - PPE, Training programme, etc.
The IMO Guidelines

As per the **ClassNK Check List** based on the requirements of the IMO Guidelines, document examinations and site inspections are carried out.

**2012 Guidelines for Safe and Environmentally Sound Ship Recycling (Res. MEPC.210(63))**

- Facility management
- Facility operation
- Worker safety and health compliance approach
  - Safe for entry, Safe for hot work, etc.
- Environmental compliance approach
  - Management of Hazardous Materials, etc.
Facility Management

✓ Company information
✓ Training programme
✓ Worker management
✓ Record management
Company Information

Status of the SRF*

Necessary company information is provided in the SRFP.

- Operator of the SRF
- Land or facility owner
- The role, responsibilities and qualification of management personnel
- Environmental, occupational safety and health management system, etc.

Confirmed by

Checking of documents

*SRF: Ship Recycling Facility
Training Programme

Status of the SRF

Training plan is developed. The plan includes handling and management of hazardous materials, fire protection and prevention, first aid, oil spillage on sea and plot, gas cutting operation, working at height confined space entry, removal of ACM, crane and forklift operation, etc. Training records are properly developed and maintained.

Confirmed by

Checking of training plan and records

Example of Annual Training Plan
Worker Management

Status of the SRF

- Each employee is registered and insured according to national requirements.
- Each worker and staff receives an ID-card with important information from the SRF.
- The personal information, certificates, education, trainings, and licenses are maintained.

Confirmed by

Interview with HSE manager and checking of ID cards and training certificates
Record Management

Status of the SRF

✓ HSE related records, such as environmental monitoring reports, medical check reports, manifests for hazardous wastes, are kept at SRF for at least 5 years.
✓ Safe for entry permit and safe for hot work permit are kept for at least three month after finishing related work.

Confirmed by

Interview with HSE manager and Checking of records

Example of the list of records
Facility Operation

- Facility information
- Permits, licenses and certification
- Acceptability of ships
- Ship recycling Plan (SRP) development
- Vessel arrival management
- Ship recycling methodology
- Reporting upon completion
Facility Information

Status of the SRF

Necessary facility information is provided in the SRFP.

- Maximum capacity of individual ship for recycling
- Maximum annual recycling capacity
- Acceptable ship types
- Location map
- Facility layout plan, etc.

Confirmed by

Checking of documents
Observation of site

Example of Facility Layout
Permits, licenses and certification

Status of the SRF

Necessary permits, licenses and certification are kept in the SRF.

- Permission for utilizing shipbreaking plot
- GEPIL membership certificate
- Explosive license for LPG
- Certificates and licenses of subcontractors, etc.

Confirmed by

- Checking of documents
- Interview with top management and HSE manager

Example of Permission for utilizing shipbreaking plot
Acceptability of ships, ship recycling plan (SRP), vessel arrival management, and ship recycling methodology are described in the SRFP.

Reporting upon completion to the competent authority is not required at this moment.

Confirmed by
- Checking of documents
- Observation on site
- Interview with top management and HSE manager
Worker safety and health compliance approach

- Worker health and safety
- Key safety and health personnel
- Job hazard assessment
- Prevention of adverse effects to human health
  - Safe-for-entry and safe-for-hot-work procedures
  - Drums, containers and pressure vessels
  - Prevention of falling from heights
  - Gear and equipment for rigging and materials handling
  - Personal protective equipment, etc.

- Emergency preparedness and response plan
- Fire and explosion prevention, detection and response
Key safety and health personnel

**Status of the SRF**

Qualification and responsibility of key safety and health personnel, such as general manager and HSE department, is described in the SRFP.

**Confirmed by**

- Checking of SRFP
- Interview with top management and HSE manager

Organizational Structure in the SRF

![Organizational Structure Diagram]
Job hazard assessment

Status of the SRF

Job hazard assessment (Risk Assessment) is carried out in the framework of OHSAS18001.

Confirmed by

- Checking of the results of Risk Assessment
- Interview with top management and HSE manager

Example of Risk Assessment based on OHSAS 18001

<table>
<thead>
<tr>
<th>Activity / Process</th>
<th>Recyclable Aspect</th>
<th>Recycling Impact</th>
<th>Casual Direct</th>
<th>Indirect</th>
<th>Consequence</th>
<th>Legal Compliance</th>
<th>Safety</th>
<th>Severity of Hazard</th>
<th>Risk Assessment</th>
<th>Control Mechanism</th>
<th>Overall Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessel Intervention in Under Anchorage</td>
<td>...</td>
<td>...</td>
<td>D</td>
<td>N</td>
<td>Y</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>- Health Hazard</td>
<td>Injury due to falling from height during climbing of ship through pilot ladder</td>
<td>Y</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Falling / Slip - Health Hazard</td>
<td>Injury due to falling from height on or slip</td>
<td>Y</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Safe for entry and safe for hot work procedure (1)

**Procedure required by “Ship Breaking Code 2013” of India**

**Anchoring**
- In the case of petroleum tankers, physical verification and issuance of gas free and fit for hot work

**After beaching**
- Issuance of gas free and man entry certificate by competent person (CP) authorized by DISH*
- Oil removal permission by GMB**

Oil removal (decontamination) **by a SRF** with safe for entry procedure

- Decontamination certificate by GPCB***
- Certificate for hot work by CP authorized by DISH
- Cutting permission by GMB

Cutting of a ship **by a SRF** with safe for hot work procedure

---

*DISH: Directorate of Industrial Safety and Health

**GMB: Gujarat Maritime Board

***GPCB: Gujarat Pollution Control Board
Safe for entry and safe for hot work procedure (2)

Status of the SRF

Safe for entry criteria

✓ Oxygen in atmosphere is ≥21%
✓ Oil gas in atmosphere is ≤ 1% of LEL
✓ Toxic gaseous, i.e., CO and H2S, in the atmosphere are within permissible concentration (50% of OEL)
✓ The safe-for-entry label and appropriate warning signs are fixed before entering the room/space
✓ Stand-by of fire hoses and fire pumps

Safe for hot work criteria

In addition to safe for entry criteria,
✓ Thorough Cleaning of residues or materials in the area
✓ Prevention of the spread of fire to adjacent spaces
Safe for entry and safe for hot work procedure (3)

**procedure**

- Safe for hot work conditions are checked by the competent person (HSE Manager) for all areas and rooms prior to conducting hot works.
- Labeling/marking/postings are done.
- Validity of the Safe for hot work certificate/label is limited to eight hours.

**Confirmed by**

- Checking of SRFP
- Checking of records (certificates, calibration records)
- Onboard observation (labelling)
Drums, containers and pressure vessels

Status of the SRF

Handling, transportation and storing of pressure vessels containing flammable gases, e.g., LPG and O2 for cutting works is done in a safe manner in order to avoid risks and human injuries.

Confirmed by

- Checking of SRFP
- Checking of records (record book of LPG cylinders)
- Site observation (condition of cylinders and tanks)

Taking care of LPG and O2 cylinders
Prevention of falling from heights

Status of the SRF

In order to prevent slipping and falling of workers and dropping or scattering of objects, the procedure for guarding of deck openings and deck edges, preventive measures such as guard rails (iron wire rope) are carried out.

“Working aloft permit” is issued by HSE Manager for the working at height.

Confirmed by

✓ Checking of records (working aloft permit)
✓ Onboard observation

Guard rail (iron wire rope) for fall prevention from height
Gear and equipment for rigging and material handling

Status of the SRF

- Workers operating lifting machines like cranes, forklifts, etc. are trained and qualified.
- Gear and equipment for rigging and material handling is tested annually.

Confirmed by

Checking of records (training records, test certificates of equipment)

Example of Test Certificate of Cranes and Winches
### Personal protective equipment (PPE)

#### Status of the SRF

Workers in the SRF wearing proper PPEs, such as cover all, helmet, safety shoes, dust mask, goggles, etc.

#### Confirmed by

**Site observation**

#### PPE Selection by the type of work

<table>
<thead>
<tr>
<th>TYPE OF WORK</th>
<th>COVER ALL</th>
<th>HELMET</th>
<th>SAFETY SHOE</th>
<th>DUST/FILTER MASK</th>
<th>SAFETY HARNESS</th>
<th>GOGGLES</th>
<th>CHEMICAL/NORMAL GLOVES</th>
<th>SCBA</th>
<th>DISPOSAL SUIT</th>
<th>BATTERY OPERATED RESPIRATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Removal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil tank cleaning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal of insulating material</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asbestos removal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paint chips removal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confined space</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas cutting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welding work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery removal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical handling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working at height</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Colour codes:**
- **Red:** At all times
- **Green:** As required
- **Blue:** Not required

Gas cutting worker with PPE
Emergency preparedness and response plan (EPRP)

Status of the SRF

- EPRP is developed and included in the SRFP.
- Emergency contact details are posted.
- Training and mock drill are carried out.

Confirmed by

- Checking of SRFP (EPRP)
- Checking of records (training records)
- Site observation (posting, assembly point, etc.)
Status of the SRF

✔ Firefighting equipment, such as fire pumps and fire extinguishers, are arranged in the SRF and stands by properly.
✔ Preventive measures, such as removal oils, are properly carried out.

Confirmed by

✔ Checking of SRFP (EPRP)
✔ Checking of records (training records)
✔ Site observation (posting, assembly point, etc.)
Environmental Compliance Approach

✅ Environmental monitoring
✅ Management of Hazardous Materials (HM)
✅ Environmentally sound management of HM

- Asbestos
- PCBs
- Ozone-depleting substances (ODS)
- Paint and coatings
- Hazardous liquids, residues and sediments
- Heavy metals

✅ Prevention of adverse effects to the environment

- Spill prevention, control and countermeasures
- Storm-water pollution prevention
- Debris prevention and control
- Incident and spills reporting procedures
Environmental Monitoring

**Status of the SRF**

Environmental monitoring is carried out twice a year by the ship recycling facilities.

- ✔ Soil
- ✔ Sea Water
- ✔ Air
- ✔ Noise
- ✔ Drinking water

**Confirmed by**

- ✔ Checking of records
  (monitoring records)

Example of water monitoring report
Status of the SRF

- Identification and marking
- Trained and qualified workers
- Monitoring of fiber concentration
- Isolation of work area
- Installation of negative pressure area
- Utilize wet condition
- Wrapped by double package
- Interim storage area
- Disposal at GEPIL
- Appropriate PPEs

Packing of ACM in special bag

Cleaning of Asbestos handling room
Management of Hazardous Materials (Asbestos)

Confirmed by

✓ Checking of records (manifests by GEPIL)
✓ Interview with HSE manager and a subcontractor
✓ Monitoring of work

Double bagging of ACM

Hazardous Waste Manifest (Asbestos)
Status of the SRF

✓ Procedure to treat PCBs in the SRF is described in SRFP, and training is carried out for workers.
✓ Cables, which may contain very small amount of PCBs, are disposed at GEPIL in accordance with national regulation.
✓ If equipment containing PCBs is found, it shall be stored without leakage under responsibility of HSE department of the SRF.

Confirmed by

✓ Checking of SRFP (procedure and subcontractors information)
✓ Interview with top management and HSE manager

Certificate of subcontractors

(PCR containing equipment may be exported for disposal to appropriate facilities in developed countries in accordance with the procedure stipulated by Basel Convention.)
Management of Hazardous Materials (ODS)

Status of the SRF

- ODS in bottles onboard is treated and surrendered to Custom Department in accordance with national regulation.
- Extraction of ODS from systems and equipment is carried out by trained personnel with adequate experience in industry along with their equipment.

Confirmed by

- Checking of Records (receipt of surrender Freon cylinder information)
- Interview with top management and HSE manager

Example of Receipt of Surrender Freon Cylinder
Management of Hazardous Materials (Paints and coatings)

Status of the SRF

- If possible, coatings are removed at and around the cutting areas.
- If removal is not possible in cutting areas, appropriate PPE is selected and applied.
- Blocks falls on the double bottom of the ship as far as possible.
- Paint chips are collected and transported to GEPIL for disposal.

Confirmed by

- Checking of Records (manifests of GEPIL)
- Interview with top management and HSE manager
- Monitoring
Management of Hazardous Materials (Heavy Metals)

**Status of the SRF**

- Lead acid batteries are transported to licensed subcontractors for recycling.
- Sand which may be contaminated by heavy metals is transported to GEPIL for disposal.

**Confirmed by**

- Checking of Records (manifests of GEPIL, license of subcontractors)
- Interview with top management and HSE manager

Authorization for handling of lead acid batteries

Zinc Anode

Lead acid batteries

Management of Hazardous Materials (Heavy Metals)
Management of Hazardous Materials

Hazardous liquids, residues and sediments

Status of the SRF

✓ Bunkers and oils are minimized prior to beaching
✓ All remaining bunker and lubricating oil are collected for recycling by a licensed subcontractor before commencement of cutting.
✓ This company sends specifically trained cleaning team for cleaning up and draining all slops into tank trucks.
✓ Residual oil storage tank is protected against leaking, overflow, fire and other potential accidents.
✓ Oily waste such as sludge is collected and transported to GEPIL for disposal.

Confirmed by

✓ Site observation (oil storage tank)
✓ Interview with HSE manager

FO Tank before & after cleaning with saw dust
Establishment of the system for dirty blocks and machinery

- Not to be placed at intertidal zone without cleaning
- To be transported to dirty block cutting area with proper spill prevention

Status of the SRF

Blocks are fall into a ship in principle.

Impermeable floor and drainage system
Block falling process (controlled gravity process)

1. Prior written notice is given to neighbors for falling a block.
2. The hull is cut except for the final cutting line. (Preparation)
3. Workers are evacuated to outside of the dangerous area except for a minimum number of person onboard to cut the final line.
4. Tension is applied by a winch onshore in order to control direction.
5. The final line is cut off to let the block fall.

Confirmed by

- Site observation (block falling process)
- Interview with HSE manager
Storm-water pollution prevention

**Status of the SRF**

- Dirty blocks and equipment is treated at oily block area with impermeable floor and drainage system.
- Rainwater from oily block area is collected in oily water tank and transported to GEPIL for disposal.
- Preventive measures for minimizing volume of contaminated water are taken.

**Confirmed by**

- Document examination of SRFP
- Site observation
- Interview with HSE manager

Example of storm water pollution prevention
Debris prevention and control

Status of the SRF

 ✓ It is very difficult to make fair judgement regarding prevention and control of debris at intertidal zones because many debris drifted ashore after every high tide.
 ✓ Continuous daily cleaning by the SRF is carried out.

Confirmed by

 ✓ Document examination of SRFP
 ✓ Site observation (checking of daily cleaning activity)

Workers cleaning the intertidal zone  
Debris collected from intertidal zone
Conclusion

- ClassNK carried out the document examination of SRFP and site inspection of four Indian SRFs in accordance with the internal checklist developed based on the IMO Guidelines (Res. MEPC.210(63)).

- As a result of the examinations and inspections, ClassNK concluded that the four SRFs are complying with HKC.

- ClassNK thinks that the important point for beaching facilities is whether the system is established or not to prevent harmful spills or emission in intertidal zones.

- Also, ClassNK thinks that following the system of continuous improvement is important and conducts annual inspection of the facilities.
Annex: Information on Alang

- Downstream Waste Management
- Labor Welfare
Downstream Waste Management

- GMB has developed a dedicated TSDF* for disposal of wastes generated from ship recycling facilities.
- GMB has contracted M/s Gujarat Enviro Protection and Infrastructure Limited (GEPIL) to operate the TSDF.

**Landfill**

- Hazardous Waste Landfill Cell (Asbestos, ACM)
- Municipal Solid Waste Landfill Cell

---

Operating Hazardous Material Landfill

*TSDF: Waste Treatment, Storage & Disposal Facility*
Downstream Waste Management

**Incinerator**

The incinerator handles:
- Oily sludge
- Oily rags / cloth and sand
- Paint & coatings
- Rubber gaskets & isolation mountings
- Insulation of damaged electrical cables
- Plastics, paper etc.

**Effluent Treatment Plant (ETP)**

- The ETP has a capacity to treat 30 m³/day of oily waste waters from ships.
- The ETP also treats leachates from the TSDF’s landfills and waste water generated from the incinerator’s flue gas scrubbing system.
Labour Welfare

Housing and Sanitation Facility

In order to provide proper housing and sanitation facilities, GMB in association with Ship Recycling Industries Association (SRIA) has taken the initiative to create a dormitory type housing facility for 1008 labourers in phase-I.

Under Construction Workers’ Barracks as in April, 2015 (source: GMB)
THANK YOU

for your kind attention

03 FEB 2016