# Inspection Report

<table>
<thead>
<tr>
<th>SGS Report No.</th>
<th>IN-NB-5301-11095-002</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGS Order No.</td>
<td>IN-NB-5301-11095</td>
</tr>
</tbody>
</table>

## SGS Contact Information (Coordinator Information)
- **Contact Person**
- **Telephone**
- **Email**

## Client
- **Contact Person**
- **Telephone**
- **Email**

## Client Contact Information
- **Contact Person**
- **Telephone**
- **Email**

## Primary Supplier
- **Contact Person**
- **Telephone**
- **Email**

## Primary Supplier Contact Information
- **Contact Person**
- **Telephone**
- **Email**

## Manufacturer
- **Contact Person**
- **Telephone**
- **Email**

## Manufacturer Contact Information
- **Contact Person**
- **Telephone**
- **Email**

### Equipment/Material Inspected
1. 32pcs - 18m long 900mm OD x 20mm wall thickness, grade S355JR steel pile casings, including 900mm OD x 50mm wt x 1000mm driving shoe
2. 38pcs - 10m long 900mm OD x 20mm wall thickness grade S355JR steel pile casings, with one end beveled
3. 40pcs - Splicing backing rings

### Technical Specification
- API 5L, EN10025 and ANNEXURE A – SCOPE OF WORKS

## Project Name

## Inspection Location

<table>
<thead>
<tr>
<th>Client Ref. No.</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer Order No.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

## Date of inspection
- 3 Dec.-11, 15-19 and 22-23 Dec., 2011

## Inspector
- Isaac Li & Todd Guo & Kim Xu & Arvin Wang & Junquan Liu & Ivan Pan

## Inspection Items
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Results (Acceptable / Unacceptable / Pending)</th>
</tr>
</thead>
</table>

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Documents review

| Raw material receiving inspection | EN 10025 | Acceptable |
| Witness Test | API 5L | Acceptable |
| 10% UT inspection | API 5L | Acceptable |
| Dimension check | API 5L | Acceptable |

Internal and external, visual inspection of welding seam, repair welding

| Loading | / | Acceptable |

Abnormal items issue

N/A

Equipment/Material inspected

During this visit, the ordered goods in below table were provided for SGS inspection, detail as follows:

<table>
<thead>
<tr>
<th>No.</th>
<th>Model &amp; Type of commodity</th>
<th>Order Qty.</th>
<th>Finished and Inspected Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20No. 18m long 900mm OD x 20mm wall thickness, grade S355JR steel pile casings, including 900mm OD x 50mm wt x 1000mm driving shoe</td>
<td>32pcs</td>
<td>32pcs and 32pcs passed</td>
</tr>
<tr>
<td>2</td>
<td>20No. 10m long 900mm OD x 20mm wall thickness grade S355JR steel pile casings, with one end beveled</td>
<td>38pcs</td>
<td>38pcs and 38pcs passed</td>
</tr>
<tr>
<td>3</td>
<td>Splicing backing rings OD860*6</td>
<td>40pcs</td>
<td>40pcs and 40pcs passed</td>
</tr>
</tbody>
</table>

Total 110pcs 110pcs and 110pcs passed

Reference Documents

- API 5L 2007 Specification for Line Pipe
- EN10025:2004 European structural steel standard

Instruments Used

During the inspection, the following instrument calibration status has been checked for inspection:

<table>
<thead>
<tr>
<th>No.</th>
<th>INSTRUMENT DESCRIPTION</th>
<th>CALIBRATION STATUS</th>
<th>CERTIFICATE NO. (OPTIONAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Impact testing machine</td>
<td>Effective</td>
<td>XJ11000264-0058</td>
</tr>
<tr>
<td>2</td>
<td>Electronic digital caliper</td>
<td>Effective</td>
<td>3XJ11000266-0008</td>
</tr>
<tr>
<td>3</td>
<td>Ultrasonic thickness meter</td>
<td>Effective</td>
<td>3XJ11000266-0030</td>
</tr>
<tr>
<td>4</td>
<td>Portable Ultrasonoscope</td>
<td>Effective</td>
<td>NT-2011012</td>
</tr>
<tr>
<td>5</td>
<td>Spectrometer</td>
<td>Effective</td>
<td>CO3-2010026</td>
</tr>
</tbody>
</table>
Remark: All instruments were on the valid period.

### Inspection Narrative Summation

1. **Documents Review**
   1.1 When SGS inspector arrived at the factory, following documents were prepared for SGS inspector review:
   - WPS/PQR,
   - Welder qualification,
   - NDE operator qualification,
   - Raw material inspection report
   - And Instrument calibration certificates.

   1.2 When the pipes were finished; below documents were submitted to SGS inspector for reviewed, which was acceptable.
   - The weld join tensile test report,
   - Mechanical performance testing report,
   - Chemical analysis for raw material,
   - Inspection record of pipes
   - And quality certificate for pipes.

   Remark: WPS/PQR was prepared as per ASME Section IX and compliance with this standard, which were accepted by client.

2. **Material Receiving Inspection**
   Materials receiving inspection was performed by SGS inspection. Details are as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Heat No.</th>
<th>Coil No.</th>
<th>Steel Grade</th>
<th>Thickness (mm)</th>
<th>Flaw</th>
</tr>
</thead>
</table>

   Remark: The result was acceptable.

3. **Witness Test**
   The following tests were witnessed by SGS inspector during the inspection, details are as below.

   3.1 Mechanical properties & chemical composition retest for raw material
   - One sample of each heat No. was cut from raw material for tensile test, chemical composition test and impact test, the result was acceptable.
1pc welding bead sample was cut from pile casing for tensile test and bending test, the result was acceptable. The detail is as below:

### 3.1.1 Physics retest for raw material

<table>
<thead>
<tr>
<th>Heat No.</th>
<th>Grade</th>
<th>Specimen No.</th>
<th>Y.P (Mpa)</th>
<th>T.P (Mpa)</th>
<th>EL (%)</th>
<th>Bending test</th>
<th>Impact AkV(J) 20°C</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>111A06951</td>
<td>S355JR</td>
<td>11205-1</td>
<td>438</td>
<td>560</td>
<td>28.2</td>
<td>No crack</td>
<td>165,173,167/168</td>
<td>Pass</td>
</tr>
<tr>
<td>112A06950</td>
<td>S355JR</td>
<td>11205-2</td>
<td>432</td>
<td>548</td>
<td>28.9</td>
<td>No crack</td>
<td>230,240,236/235</td>
<td>Pass</td>
</tr>
</tbody>
</table>

### 3.1.2 Chemical composition retest for raw material

<table>
<thead>
<tr>
<th>Heat No.</th>
<th>Grade</th>
<th>Specimen No.</th>
<th>C%</th>
<th>Si%</th>
<th>Mn%</th>
<th>P%</th>
<th>S%</th>
<th>Cu%</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>111A06951</td>
<td>S355JR</td>
<td>11203-6</td>
<td>0.15</td>
<td>0.32</td>
<td>1.48</td>
<td>0.014</td>
<td>0.006</td>
<td>0.016</td>
<td>Pass</td>
</tr>
<tr>
<td>112A06950</td>
<td>S355JR</td>
<td>11203-7</td>
<td>0.15</td>
<td>0.34</td>
<td>1.48</td>
<td>0.013</td>
<td>0.003</td>
<td>0.017</td>
<td>Pass</td>
</tr>
</tbody>
</table>

**Remark:**
1. The result was acceptable according to EN 10025:2004 and API 5L PSL1 2007.
2. The below table was corresponding heat No. and products size.

<table>
<thead>
<tr>
<th>Heat No</th>
<th>Products size</th>
</tr>
</thead>
<tbody>
<tr>
<td>111A06951</td>
<td>OD900*20</td>
</tr>
<tr>
<td>112A06950</td>
<td>OD900*20</td>
</tr>
</tbody>
</table>

### 3.2 Physical for weld bead

<table>
<thead>
<tr>
<th>Pipe size</th>
<th>Pipe No.</th>
<th>Specimen No.</th>
<th>Y.P (Mpa)</th>
<th>T.P (Mpa)</th>
<th>Bending test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD900*20</td>
<td>01</td>
<td>11210-1</td>
<td>273</td>
<td>549</td>
<td>N/A</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11210-2</td>
<td>N/A</td>
<td>N/A</td>
<td>No crack</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11210-3</td>
<td>N/A</td>
<td>N/A</td>
<td>No crack</td>
<td>Pass</td>
</tr>
</tbody>
</table>

### 3.3 UT and MT test

Sample size: 10% UT and MT.
7pcs pipes were selected randomly for UT and MT test witness, the result was acceptable as per API 5L PSL 1 2007.

#### 3.3.1 MT test

During this visit, 7 pipes (No.28-3221, No.03-3167, No.07-3175, No.08-3177, No.11-3185, No.02-3170 and No.03-3175) were carried out MT test which was witnessed by SGS inspector, the result is as follow.

Before carried out testing, NDT operator had calibrated the equipment, then done the testing according to process and no defect which go beyond the limit of the standard of level II has been found, the result was acceptable.

#### 3.3.2 UT test

During this visit, 7 pipes (No.28-3221, No.03-3167, No.07-3175, No.08-3177, No.11-3185, No.02-3170 and No.03-3175) were carried out UT test which was witnessed by SGS inspector, the result is as follow.

Before carried out testing, NDT operator had calibrated the equipment, then done the testing according to process and no defect which go beyond the limit of the standard of level II has been found, the result was acceptable.
4. **Dimension Check**
   During manufacturing, all finished products were selected for dimension check. The OD, Length and roundness was acceptable according to API 5L PSL1 2007

5. **Internal and external, visual inspection of welding bead, welding repair**
   During this inspection, visual inspection of welding bead was carried out after repaired welding bead were finished. Undercuts≤0.8mm, internal weld reinforcements≤3.5mm and external weld reinforcement≤4.5mm, no obvious defect was found.
   No porosity, crack, spatter, weld flash and weld defect were found on pile casings. The internal concavity was found and not lower than the base metal. The detail is as below,

   ![The inner welding bead]

   **Remark:** The result was acceptable.

6. **Loading Supervision**

   - Pre-loading and loading supervision survey

   We report the following:
   6.1. The loading to the port from factory
   Several pipes were loaded onto a truck and tightened with nylon rope, total 13 trucks, and delivered to Shanghai port on 19 Dec., 2011.
6.2. Pre-loading inspection
Pre-loading inspection was carried out on 22nd, December 2011 at Shanghai port.
Weather condition at the time of survey: Cloudy.

6.2.1 Storage:
Total 70 pieces of the pile casings (declared to be SSAW Pipe LSAW Pipe) were stored on open yard of LUOJING terminal of Shanghai port, China. The storage ground was noted cement ground and to be in clean condition and free from chemical job and nearby river.
Cargo were found stored on yards up to 3 tiers high without covering protection. And without dunnage supported to separation ground and bottom tubes.

Total 40 pieces of the cargo (LSAW PIPE, SIZE: 860X6) were found stored in warehouse of LUOJING terminal of Shanghai port, China. The storage ground was noted cement ground and to be in clean condition and free from chemical job.

6.2.2 Packing:
Tubes were found packed in bare condition.

6.2.3 Marking:
Each tube was supplied on pipe’s inner surface of both ends, which read in English, for example:

- API5L PSL1
- Φ900X20X10000
- S355JR
- HEAT NO. 112A06950
- HEAT NO. 111A06951
- 06 3173

6.3. Loading supervision at port:
A cargo loading supervision had been carried out at pier side of vessel M.V."ALEXANDERGRACHT" during loading on 22nd, December 2011
Weather Condition during Loading: Overcast

6.3.1 Time log

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessel Arrived, Shanghai Port</td>
<td>2100</td>
<td>21 December 2011</td>
</tr>
<tr>
<td>Berthed at Pier</td>
<td>1230</td>
<td>22 December 2011</td>
</tr>
<tr>
<td>Commenced Loading</td>
<td>1620</td>
<td>22 December 2011</td>
</tr>
<tr>
<td>Commenced Lashing</td>
<td>2230</td>
<td>22 December 2011</td>
</tr>
<tr>
<td>Completed Loading</td>
<td>2230</td>
<td>22 December 2011</td>
</tr>
<tr>
<td>Completed Securing</td>
<td>2320</td>
<td>22 December 2011</td>
</tr>
<tr>
<td>ETD</td>
<td>0100</td>
<td>23 December 2011</td>
</tr>
</tbody>
</table>

6.3.2 Brief Description of Vessel

M.V. “ALEXANDERGRACHT” was found to be a bulk carrier with three single cargos holds all forward of accommodation and machinery space.

The vessel laid securely moored starboard side to LUOJING port terminal, Shanghai, China.

6.3.3 Shifting from yard

Pieces were shifted onto port trailers from the port yard using vehicle cranes, and then transferred to loading berth. On port yards, pieces were lifted using nylon straps with hooks. Each trailer carried up to 4 pieces.

6.3.4 Loading alongside the vessel

Alongside the vessel, the consignment was loaded directly from port trailers to vessel’s and using one shore crane, the pipes were lifted by steel hooks, up to 2 pieces per sling.

6.3.5 Storage

Before loading, the hold No.2 of the vessel was visual inspected by SGS surveyor and noted to be in dry and clean condition. Our cargo was loaded and stowed in hold No.2 and deck.

6.3.6 Dunnage and lashing/securing

During loading, wooden timbers were used between the deck and pipe to avoid cargo touch the ship directly. After the loading completion, our cargos (Steel pipes) were lashed by up to 6 pieces of steel wire on deck. The entire lashing and securing checked by Chief Mate and SGS surveyor found in sound condition.

6.3.7 Tally

A tally survey to determine the quantity of the goods loaded on board was carried out during loading, as per our tally, found total 40 pieces were loaded into hold No.2, and total 70 pieces of the pipe were stowed on deck of the vessel MV “ALEXANDERGRACHT”, the detail as follow:

<table>
<thead>
<tr>
<th>Item</th>
<th>ID (mm)</th>
<th>WT (mm)</th>
<th>Length (m)</th>
<th>Quantity (pcs)</th>
<th>Weight (MT)</th>
<th>Hold</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. SSAW Pipe</td>
<td>900</td>
<td>20</td>
<td>18</td>
<td>20</td>
<td>156.255</td>
<td>On deck</td>
</tr>
<tr>
<td>1b. LSAW Pipe</td>
<td>900</td>
<td>50</td>
<td>1</td>
<td>20</td>
<td>20.962</td>
<td></td>
</tr>
</tbody>
</table>
6.3.8 Visual cargo condition inspection during loading

A visual cargo condition inspection was carried out during preloading and loading operation. As far as visible and accessible, all of the steel pipes were found slight scrape and rust stained on the surface.

### Document Review

The SGS inspectors reviewed the following documents:
- WPS/PQR
- Welder Qualification
- NDE Operator Qualification
- Raw material inspection report except Splicing backing rings
- Material certificate
- Finished inspection report
- Steel mill MTC
- Instrument calibration

### Photo

![Photo 1](image1.png)

![Photo 2](image2.png)
<table>
<thead>
<tr>
<th>Forming</th>
<th>Steel pipe on the product line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension check</td>
<td>Repairing weld bead</td>
</tr>
<tr>
<td>Welding</td>
<td>Cutting the pile casing</td>
</tr>
<tr>
<td>The end of pile casing</td>
<td>Finished products</td>
</tr>
<tr>
<td>Check the thickness of raw material</td>
<td>The label on the raw material</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Chemical composition test</td>
<td></td>
</tr>
<tr>
<td>Impact test</td>
<td></td>
</tr>
<tr>
<td>Tensile test</td>
<td>The bending test specimens of raw material</td>
</tr>
<tr>
<td>The sample of welding bead</td>
<td>Material tensile test for welding bead</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Bending test for welding bead</td>
<td>UT test</td>
</tr>
<tr>
<td>White marking</td>
<td>White marking</td>
</tr>
</tbody>
</table>
Storage cargo condition on open yard
Size: 900 x 20 x 19000mm

Shoes: 900 x 50 x 1000mm

Rust stained on surface

Storage cargo condition on open yard
Size: 900 x 20 x 10000mm

Splicing backing rings: 860 x 6mm

Rust stained on surface
Carrying vessel

During loading

Stowed on deck

Blank

Blank

Lashing

Remarks

1. This report only reflects our findings at time and place indicated above only and does not refer to any other matters.
2. This inspection has been carried out to the best of our knowledge and ability and our responsibility is limited to the exercise of reasonable care.

3. All orders are accepted and all reports and certificates issued subject to the General Conditions of Service. (copy available upon request)

Issued by
Isaac Li
Inspector
Industrial Services
SGS-CSTC Nanjing office
23 Dec., 2011

Reviewed by
Mailer Mao
Inspection Supervisor
Industrial Services
SGS-CSTC Nanjing office
26 Dec., 2011