MILL INSPECTION TEMPLATE:

SAG & BALL MILLS

Site / Plant Name:	Storage places in Le Havre (France) : Amster & Roll Manutention
Country:	France
Date:	14-16 March 2022
Mill Size:	SAG 9,75m dia. x 5m (EGL), 2 x 7000kW Ball 6.4m (21') dia. x 9.6m (EGL), 8000kW Still to be confirmed
Client Mill Number / Name:	/
NCP Mill Serial Number:	/
Installed Mill Power:	See above
Mill Type (Ball, SAG, AG):	One SAG mill & One Ball mill
Liner Type (Steel, Rubber, Polymet)	Steel for SAG mill and Rubber for Ball mill
Inspection Time Allowed:	3 days
Average Ambient Temperature:	10° C
NCP Inspector:	Emmanuel CHEVALIER
NCPI Reference Number:	SER22.502
Last Mill Inspection:	2 years ago, by Outotec
Next Mill Inspection:	At project go-ahead, prior to shipping the goods to site or refurbishment place(s)

1. GENERAL INFO & NOTES:

The parts are stored in 2 different places, Amster and Roll Manutention, close to Le Havre harbour in the Northwest of France. Some equipment is stored indoor and some outdoor.
We can refer to the 2 reports issued by Ian Major (DRA Toronto) on 3rd January 2022.

<u>The purpose of the visit is to:</u>
- Check that all mill components are still available at the storage places
- Assess the condition of critical components and define those that can be used as is, or after refurbishment, or scrapped.

The inspection takes places with:
- Ian Major from DRA Canada
- Richard Furlong from Metso Denver (Gyratory crusher)
- Werner Klodner from Outotec Sweden (Mills)
- Emmanuel Chevalier from NCPI

The only documents provided by SENET before the visit are the 2 reports from Ian Major and one Outotec's packing list Packing list W OUT-HYD-001...OUT-TRA-005_Rev1.

2. SHELLS

A/ SAG MILL SHELL

Visual inspection (2 cans at 180°): Stored outside at Roll Manutention.

The shell looks in good conditions. Most of flange wooden protection is still in place.

Nota: M:O is recommending shipping the SAG mill shell to site and clean it before installation.

B/ BALL MILL SHELL

Visual inspection (2 cans at 360°): Stored outside at Roll Manutention.

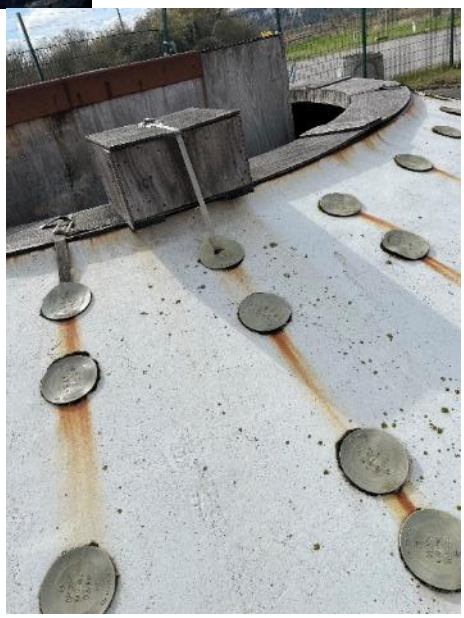
The shell looks in good conditions. Most of flange wooden protection is still in place.

Nota: M:O is recommending shipping the Ball mill shell to site and clean it before installation.

3. HEAD MILLS

A/ SAG MILL HEADS

Visual inspection (4 segments at 180°): Stored outside at Roll Manutention.



Most of the wooden packing is still in place on the inner flange on the outer flange.

The wooden crate on top of the mill heads is, according to Outotec, for lifting lugs but we did not open it.




The wooden packing is broken at a few places on the bolting flange.
No indent is noted.
The rust preventive seems to still be heavily present but disappeared in a few places only, that we had access to.
We have not unpacked much as there was no company available to put any packing back.

Nota: M:O is recommending shipping the SAG mill heads to a workshop for cleaning and inspection prior to assess if any machining is required prior to shipping the head segments to site.

B/ SAG MILL TRUNNIONS
Visual inspection (2 wooden crates): Stored outside at Roll Manutention.

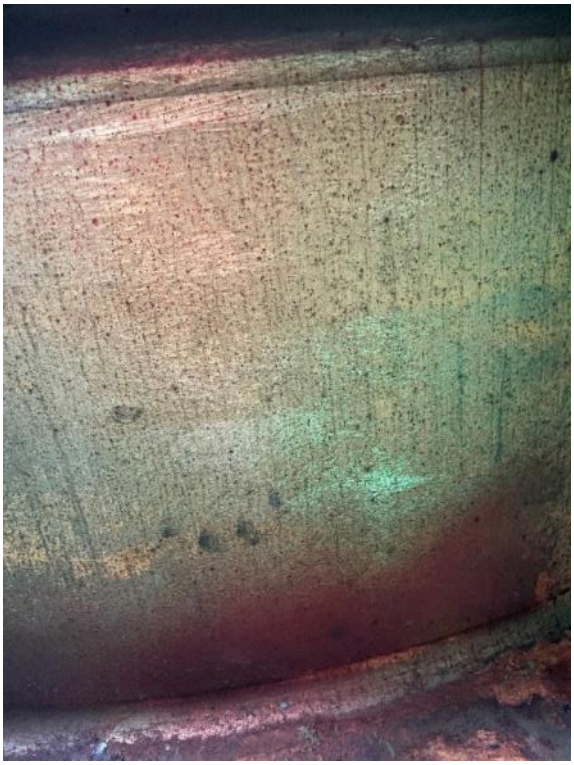
Discharge Trunnion to packing list OUT-SIE-006

Nobody could help for unpacking so we just made a opening on one side to see how it looked and the protection seems to still be OK

Feed Trunnion to packing list OUT-SIE-005

The rubber protection was not put back on top of the lugs so I insisted to get a larger opening so I could go inside the crate to check the protection and surface conditions.

The plastic protection was full of water and the bearing surface rusted, per the pictures below.

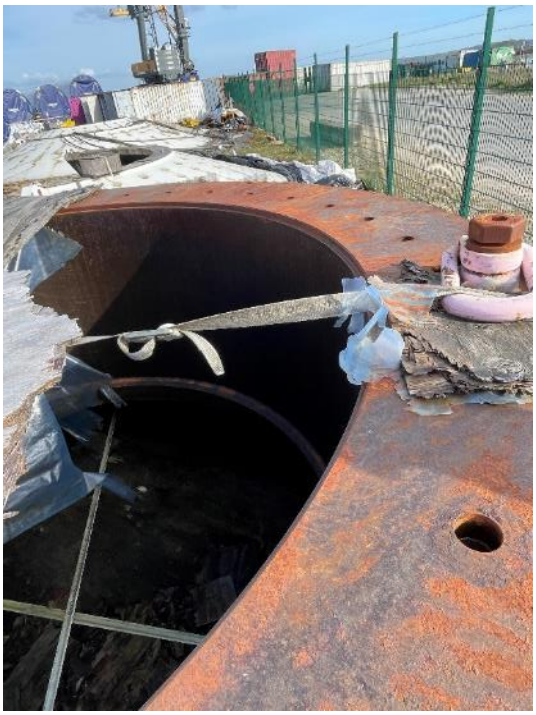


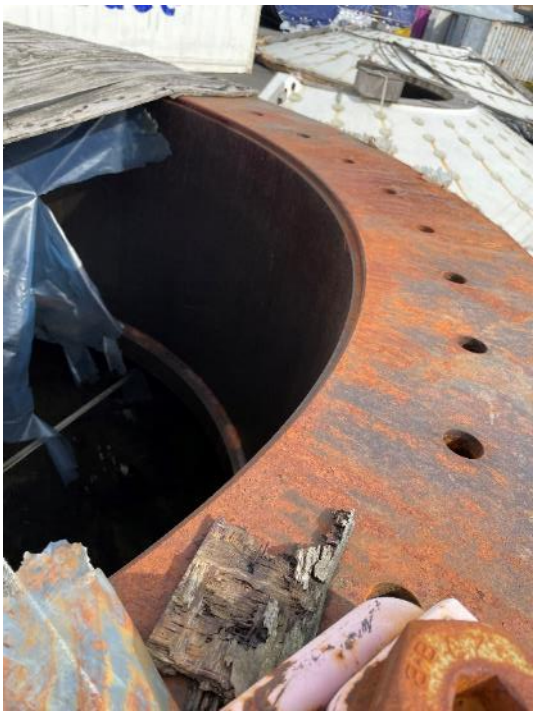

We can only suspect that the Discharge Trunnion could be in the same conditions.

Nota: M:O is recommending shipping the Trunnions to a workshop for cleaning, inspection prior to assess if any machining is required prior to shipping the Trunnions to site.
M:O strongly believe that no machining will be required.

C/ BALL MILL HEADS
Visual inspection (2 Integral heads at 360°): Stored outside at Roll Manutention.

The wooden packing is still in place in many locations but well damaged in other areas where the surfaces are open to sun and rain.





The bearing area seems to be still well protected so we did not want to break the packing to perform a more detailed inspection here.

We could however access to the bearing area through a short area with packing already damaged, per the pictures below.




Nota: M:O is recommending shipping the Mill heads to a workshop for cleaning, inspection prior to assess if any machining is required prior to shipping the Mill heads to site.

It seems like the only option for M:O is to ship all heads and trunnion back to Germany for such assessment.

4. LINERS

A/ SAG MILL

These Steel liners could not be located. Not sure they are here in France.

B/ BALL MILL

These Rubber liners are stored indoor at Amster, Building B1.

We could not count the number of liners but a lot of them could be seen in the building.

Packing lists are OUT-MET-xxx.

5. TRUNNION INSERTS

Visual inspection (2 inserts at 360°): Stored outside at Amster.

A/ Insert #1, closed to B0 Building:




Some dimensions were checked:

- OD 1 960 mm ; Total height 1 760 mm
- Bottom flange details: OD 2 760 mm ; Thickness 40 mm ; 24 holes Ø40
- Middle flange details: OD 2 760 mm ; Thickness 40 mm ; 36 holes Ø40

B/ Insert #2, next to the gear quarters:

Some dimensions were checked:

- OD 2 300 mm ; Total height 2 540 mm
- Bottom flange details: OD 2 660 mm ; Thickness 20 mm ; 16 holes
- Middle flange details: OD 3 280 mm ; Thickness 50 mm ; 48 holes Ø45

Seems to be fine to ship these directly to site.

6. TRUNNION BEARINGS

5 crates stored indoor at Amster, in Building B0.

Another crate is stored indoor at Amster, in Building B1

7. GIRTH GEARS

8 Gear quarters are stored outdoor at Amster

Most wooden packing is still in place but the top is well damaged. We have access to almost all assembly joints and the teeth in a few areas.

We can see a large amount of rust in the tooth area but the rust is still there.

I may not be as bad as what it looks.

Mill	SAG MILL	BALL MILL
No of Teeth (Gear / Pinion)	344 / 19	212 / 19
Module	34	42
Face width (Gear / Pinion) (mm)	810 / 830	975 / 995
Segment Qty	4	4
Gear Material & Hardness	Unknown but probably 290HB fabricated steel	
Distance from ID to OD (mm)	970	1 255
Rim Thickness (mm)	180	195
Number of Openings	9 per quarter	7 per quarter
Assembly Joint Thickness (mm)	170	170
Web Thickness (mm)	120	140
Other Notes / Comments See attached Packing List OUT-VDW-015 / 008 / 004 / 010 for gears and pinions.		

Nota: M:O is recommending shipping all gear segment to a gear manufacturer (probably VDW) for cleaning, full inspection prior to assess if any machining/cutting is required prior to shipping the gears to site.

2 crates are next to the gears with gear assembly bolts:

See attached Packing List OUT-VDW-005 / 013.

Nota: M:O is recommending that all assembly bolts are replaced (without opening the crates!).

8. PINION ASSEMBLIES

5 crates are stored outdoor at Amster, next to the gear quarters and gear guards.
Probably 2 main pinions and 1 spare for the SAG mill and 1 main pinion and 1 spare for the Ball mill.

Most crates are still in acceptable conditions but one of them is damaged on the top and on the side. We could see that there is still some good plastic protection but could not assess the conditions of the bearing areas and the teeth.




Nota: M:O is recommending shipping all pinions to a gear manufacturer (probably VDW) for cleaning and full inspection prior to assess if any machining/cutting is required prior to shipping the pinions to site.

9. GEARBOX & COUPLINGS

No gearbox for this project.

No coupling identified at Amster but it could easily be crated and stored indoor in Building B1.

10. MOTOR

ABB Motor are not stored in France and could not be seen.
Many ABB crates are however stored indoor at Amster in Building B1.

11. BARRING GEAR ASSEMBLY

2 Inching drive are stored in a container at Amster.

12. LUBE SYSTEMS

8 containers are stored outdoor at Amster with (apparently) the Lube systems. We have not opened these containers as it has already been done by Ian in December 2022.
Please refer to his report at Amster, pages 88 to 98.

Pictures of all containers were made to keep track of these based on Ian's report.

13. FEED CHUTES & TROLLEYS

A/ FEED CHUTES

2 Feed Chutes are stored outdoor at Amster, next to the gears and pinions:

One must be for the SAG mill and one for the Ball mill as the diameters to feed the mills are different, by far:

Flange OD 1500 / Flange ID 1280

Flange OD 900 / Flange ID 700

The overall dimensions are however the same: L 1800 x W1490 x H2020.

B/ TROLEYS

2 trolleys are stored outdoor at Amster, next to the feed chutes:

Packing list OUT-TUR-003 / 004.

14. DISCHARGE TROMMEL SCREEN

A/ SAG MILL

No trommel but screening with crates stored outdoor at Amster, at a few places.

B/ BALL MILL

One Trommel screen is stored outside at Amster, between Building B0 and B1.

Some dimensions were taken:

- Trommel length: 3 400 mm F/F + 200 mm at the end
- Flange details: ID 1 960 ; OD 2 770 mm ; 24 holes Ø40
- Internal distance between panels: 2 280 mm
- Panel size: 600 x 300 mm ; Aperture 14 x 32 mm
- 132 panels in total: 11 on the length and 12 on the circumference
- Size of rubber, inside the trommel: 530 x 200 x 40 mm

Nota: M:O is recommending to supply new Trommel!

15. INSTRUMENTATION & SCADA

Not checked

16. CRADLES

A few cradles are stored outdoor at Amster and Roll Manutention.

17. TOOLS CONTAINERS

2 tools containers are stored outdoor at Amster.





18. RECONCILATION OF CRATES IN BUILDING B1 AT AMSTER FACILITY

To follow shortly.

Draft Preliminary report REV01
Issued by Emmanuel Chevalier
On 17th March 2022 at 10.00am, French time