

FALIURE ANALYSIS OF EXCITER GEARBOX AT SINTER PLANT # 1

SINTER PLANT # 1(MECH)

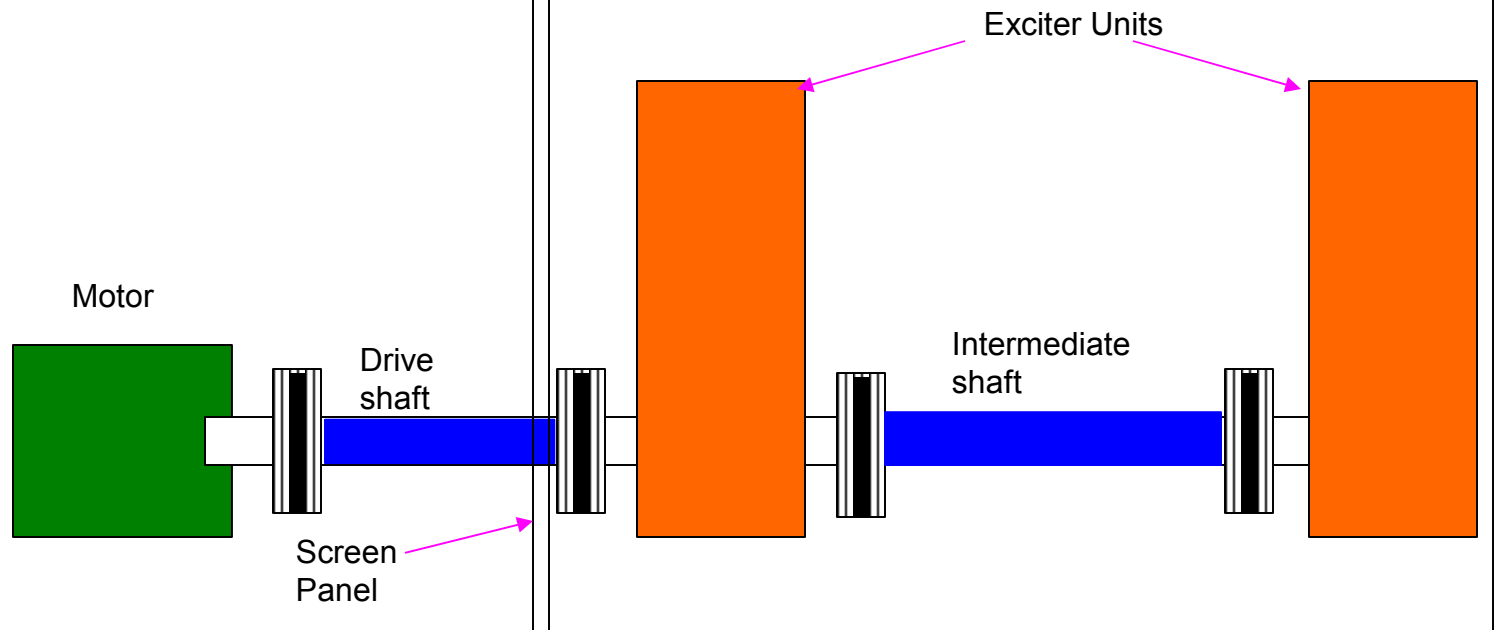
EQUIPMENT NO	:	2080 (HOT FEEDER)
COMPONENT WHICH FAILED	:	EXCITER GEARBOX
FAILURE DATE	:	10/11/2005
TIME	:	6:00 PM TO 11:35 PM
TOTAL DOWN PERIOD	:	5.5 HOURS
LOSS DUE TO DOWN TIME IN RS:		70000 X 5.5 = 385000 = 3.85 Lac.

SINTER PLANT # 1(MECH)

GENERAL INTRODUCTION ABOUT EQUIPMENT

Sinter Plant # 1 has two machine. Hot feeder(2080) is in the line of machine no two. It is installed after hot screen which receives +5 mm hot sinter. After this feeder hot sinter is feed to sinter cooler for cooling. The feeder is in the critical part of the machine. The production stops completely if any equipment of the circuit fails.

General Arrangement of the equipment is as follows.



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Phenomenon Observation

When

10th Nov 2005 in B Shift at 0600 PM

What

Hot Feeder (2080) Tripped.

Where

Sinter Plant # 1 2080 offside exciter gearbox.

Who

Mr.P.R.Jhanghel , Sr.Technician (Mechanical) has checked.

Why

Exciter gearbox got jam due to bearing failure.

How

The motor was tripped on high current.

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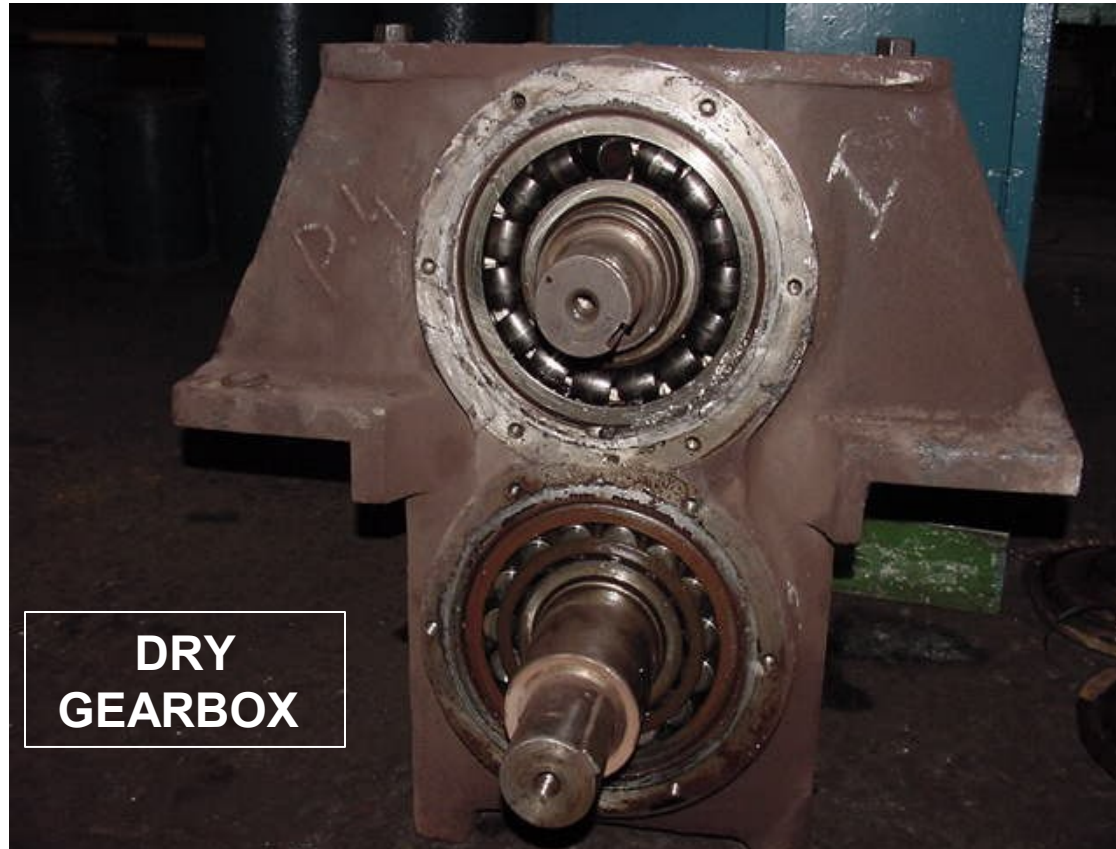
HISTORY

- ✓ There are two Hot Feeder in Sinter Plant # 1 and each of them have two exciter gearboxes.
- ✓ On 8/11/2005 hot feeder (2080) tripped at 12:05 am.
- ✓ Offside exciter gearbox of hot feeder finally failed on 10/11/2005 at 6:00 pm.
- ✓ The gearbox was replaced with new one and failed gearbox was taken to mechanical repair shed for failure analysis.

SINTER PLANT # 1(MECH)

OBSERVATION NO : 1

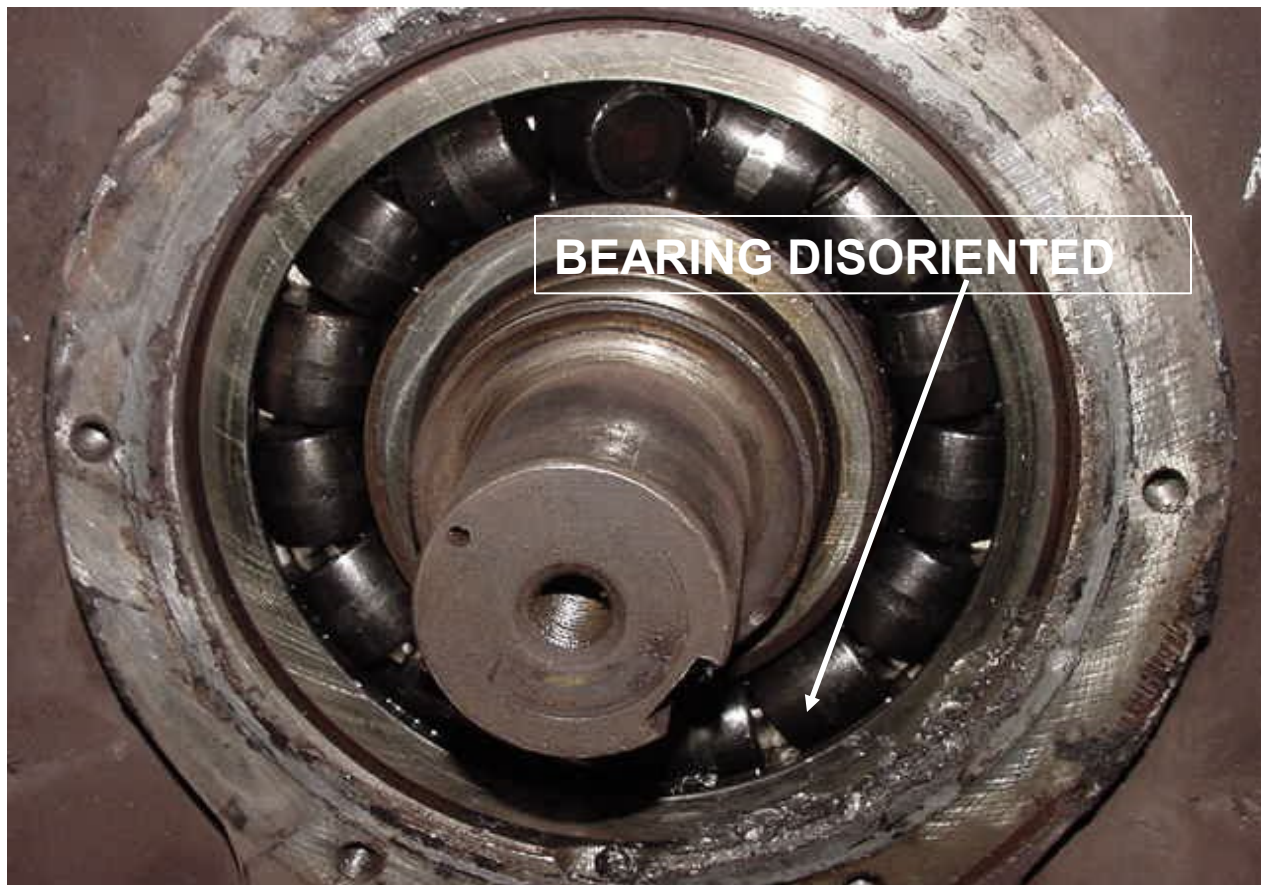
Damaged bearing shows sign of oil starvation.



SINTER PLANT # 1(MECH)

OBSERVATION NO : 2

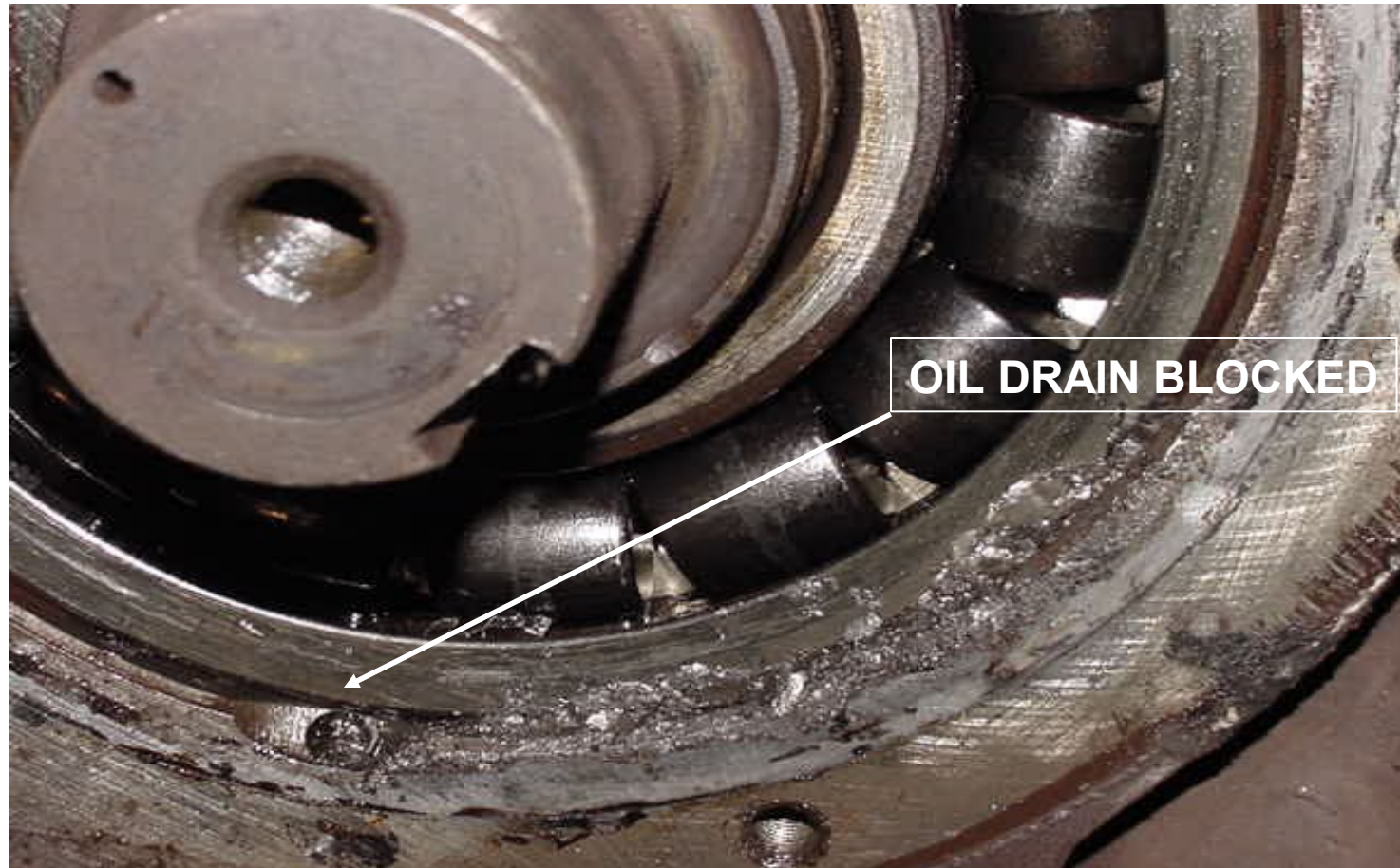
It has double row spherical roller bearing .The cage had got completely damaged and the rollers had got disoriented.



SINTER PLANT # 1(MECH)

OBSERVATION NO : 3

The drain oil port on the damaged bearing side was choked



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OBSERVATION NO : 4

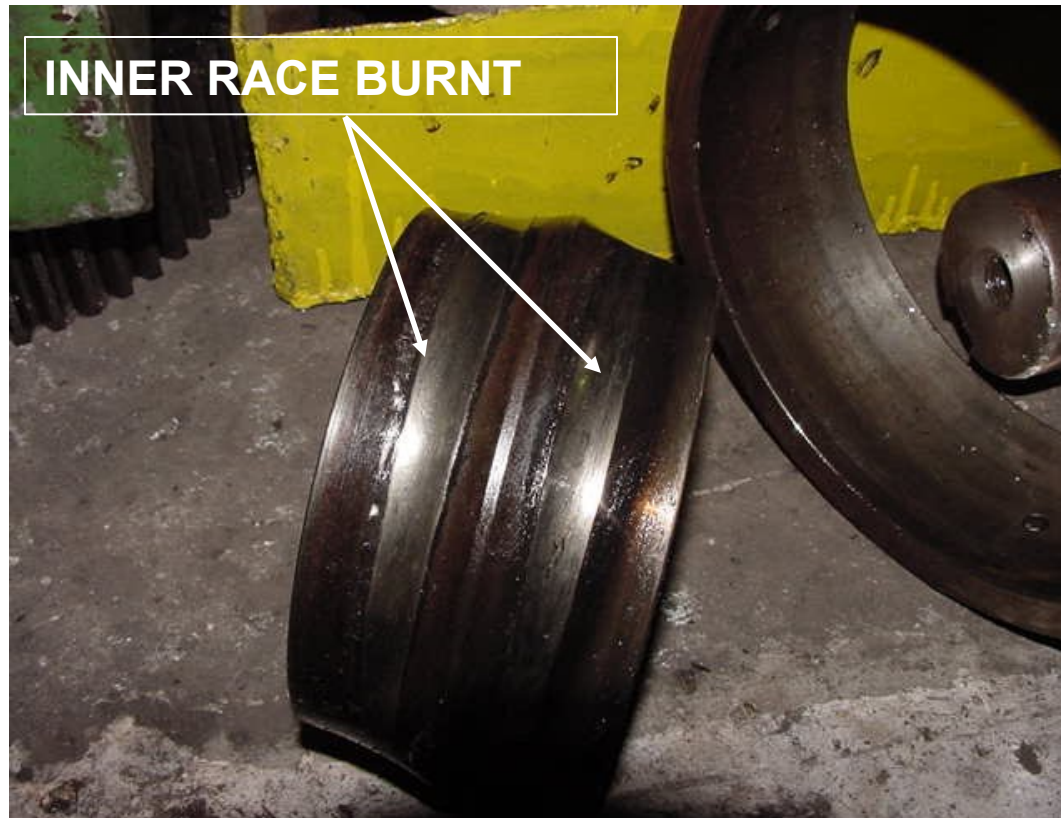
The labyrinth ring was also badly damaged .
Labyrinth ring seized on end cover.



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OBSERVATION NO : 5

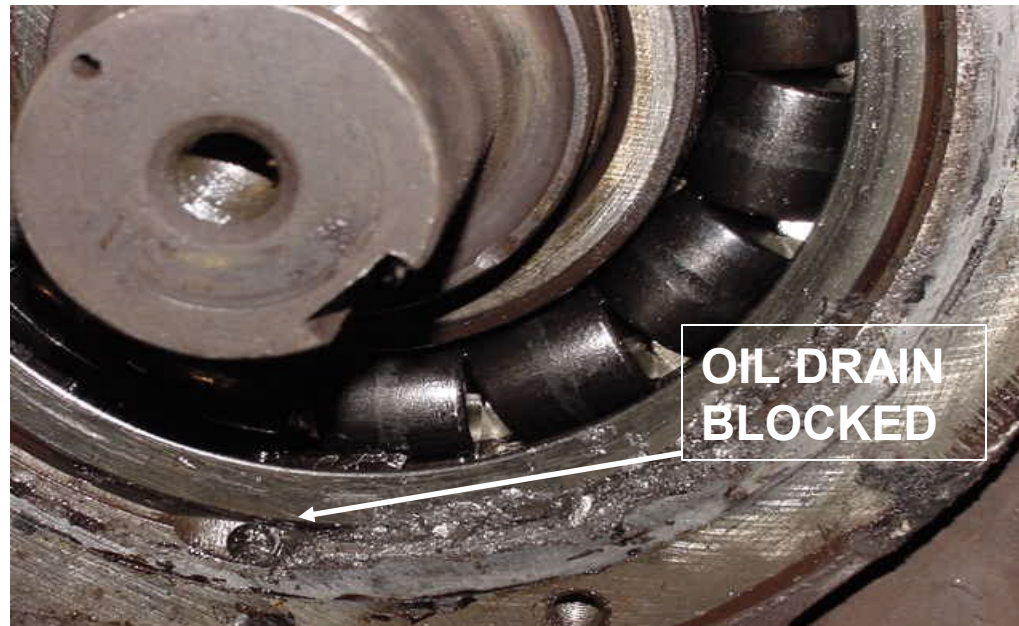
The inner race of the damaged bearing showed signs of excess heat on the roller tracks



SINTER PLANT # 1(MECH)

ANALYSIS (REASONS FOR INCIDENCE)

- ✓ Excess oil from the end cover goes back into the gearbox through the drain port which lubricates bearing.
- ✓ Felt used for sealing worn out due to excess heat and its ageing.
- ✓ Damaged felt choked the oil drain port.
- ✓ Due to blockage of drain port oil does not go back to gearbox and oil level starts reducing.
- ✓ This leads to oil starvation of bearing and bearing fails.



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RECOMENDATIONS

- ✓ **For sealing purpose felts should be replaced by rolled yarn consisting of PTFE which can absorb maximum temperature.**
- ✓ **Correct oil level of the gearbox to be maintained.**
- ✓ **A Time based maintenance schedule to be prepared for exciter gearbox changing to overcome ageing effect.**

SINTER PLANT # 1(MECH)

Mr.T.Watanabe's Comments

1. The trend of current variation in the motor must be noted
2. Continuous current monitoring device with alarm may be used
3. If the gear box is in use for quite a long time, all the last failures in the gear box must be analyzed
4. Considering the application of Gear box, it should not fail so frequently

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THANK YOU