vedanta
transforming for good

INFINITE UPTIME
Production Outcomes. Delivered.

PlantOS™
Manufacturing Intelligence

Delivers

3X ROI

Within 12 months

Vedanta Group **unlocked value**

From **Plant Sites**

To **Boardrooms**

Vedanta unlocks value with **PlantOS**™

Metals of Progress

India's metals sector market size exceeding USD 225 billion in FY24, driven by steel and critical non-ferrous metals such as aluminium, copper, zinc, lead, and nickel. This sector is projected to grow at a CAGR of approximately 6-7%, surpassing USD 350 billion by 2033, propelled by demand from infrastructure, automotive, electrical, and renewable energy industries [1][1.A][1.B].

Vedanta x Infinite Uptime

65
plants digitalized globally

99.97%
Prediction accuracy

1582
Prescriptions acted upon

10340
unplanned downtime hours eliminated

Note – *Data as of Sep 17th, 2025* Source- *PlantOS™ Digital Reporting System – User Validated True Positives & False Negative Rate*

Vedanta Group, a global powerhouse has steered this industrial acceleration with flagship subsidiaries like Vedanta Aluminium (VAL) and Hindustan Zinc Limited (HZL) amongst others.

Vedanta Aluminium (VAL) and Hindustan Zinc Limited (HZL) together represent over 40% of the nation's total aluminium and zinc output, solidifying their status as industry leaders [2][3].

#AI4ProductionOutcomes

Scan to Talk to an Expert and discover how Production outcomes can be transformed

Navigating Operational Challenges

Despite scale and technological intent, in FY21-22 VAL Jharsuguda—Vedanta's flagship aluminium plant in Odisha—grappled with frequent breakdowns in critical assets: Potlines and Ball Mills.

Unplanned downtime in these units is an industry-wide Achilles' heel, with losses often spiralling into the range of USD 100,000 to 500,000 per day for major operations depending on scale and duration[4]. Ball Mills alone account for 50–70% of total plant energy use, and their motor failures create ripple effects across production targets[5]. Industry estimates peg unplanned downtime losses at 37% of production time for such assets, leading to missed targets, strained workforce resources, and mounting repair expenses[6]. Without predictive control, routine man-machine interaction further exposed teams to safety risks and compromised operational efficiency.

Ball Mill Grinding Mineral Ore

> The significant decline in production for the year FY23-24 was mainly due to ore availability challenges, and significantly **lower throughput**.

Integrated Report and Annual Accounts 2023-24, ***Vedanta Limited*** (4)

In 2021, VAL sought a solution that transcended traditional maintenance, envisioning a future where equipment reliability would directly translate to productivity, safety, and measurable ROI.

The PlantOS™ Difference

The partnership began in June 2021, when Infinite Uptime deployed 350+ intelligent sensors at key Potline and Ball Mill locations amongst others in VAL Jharsuguda. The deployment of PlantOS™—the world's most user-validated Prescriptive AI platform—introduced predictive, prescriptive analytics and seamless remote monitoring across the plant's critical machinery.

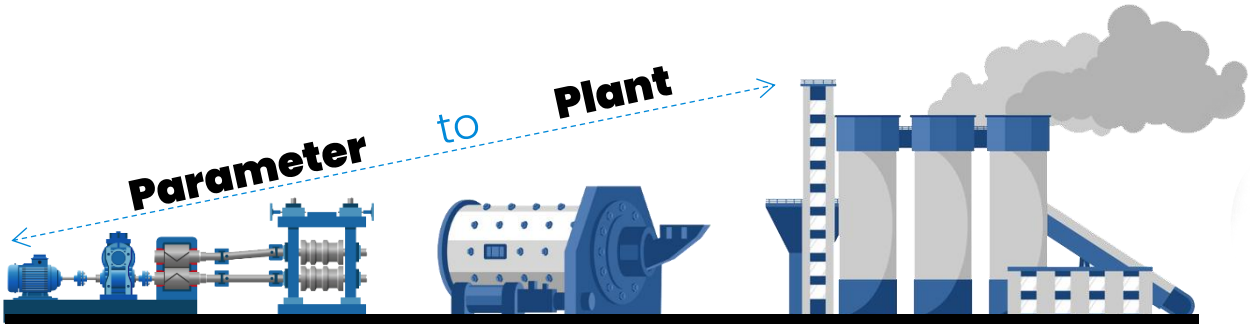
Within a year...

REDUCED
Unplanned downtime hours and cost of maintenance/energy thus unlocking hours in productive capacity

CREATED
Digital workflows, remote diagnostics, and actionable alerts, directly improving safety and reducing exposure in hazardous environments

SAFEGUARDED
ROI by streamlining asset performance, real-time insights, and enabling faster, agile responses to production demands

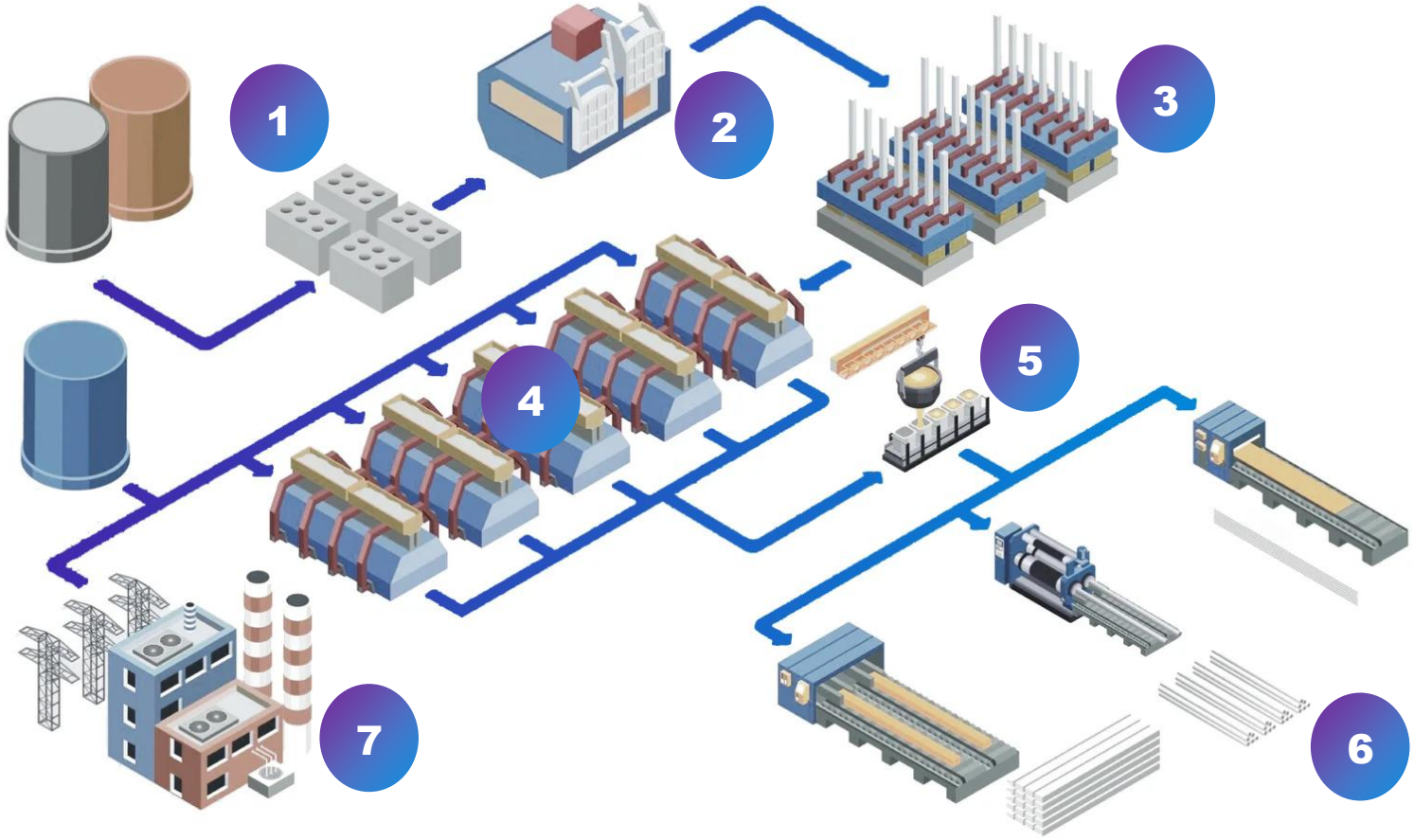
Since June 2021, the proven impact led Vedanta to scale Infinite Uptime's PlantOS™ from a single plant site at VAL Jharsuguda with 350+ monitoring locations to a sweeping deployment of 16,509 sensors across 65 plant sites, spanning multiple industries & strategic subsidiaries—including BALCO (Chhattisgarh), Lanjigarh (Odisha), & HZL in Bokaro, covering diverse mines Ball mills, Potlines, & smelters throughout the Vedanta Group portfolio.



Scan to Talk to an Expert and discover how Production outcomes can be transformed

The Semi-Autonomous Reality: Powered by PlantOS™

With PlantOS™, Vedanta is advancing toward semi-autonomous plant operations, digitally integrating critical assets and processes. From Green Anode Plant to Ball Mills, AI-driven workflows, remote diagnostics, and automated alerts orchestrate seamless production agility, safeguarding ROI while reducing manual interventions and elevating operational safety across the entire aluminium production line.



1 Green Anode Plant (GAP)

- Ball Mill
- Bucket Elevator
- ID Fan
- Kneader
- Paste Mixer

2 Baking Furnace

- FTA Blower
- FTA Compressor
- FTP ID Fan

3 Rodding

- Autogenous Mill
- Belt Conveyor
- Shot Blast Unit
- Dust Collector Fan
- Butt Press Pump

4 Potline

- Circulation Blower
- ID Fan
- Belt Conveyor

5 Cast House

- Ingot Transfer Fork
- Cooling Conveyor
- Layer Conveyor
- Stack Conveyor
- Casting conveyor
- Wire Rod Mill
- Cooling Tower
- Saw Cutter
- Air compressor
- Pit Pump
- Crane
- Billet Cutter

6 Rolling

- Rough Rolling Stand
- Finish Rolling Stand
- Anealing
- Cooler Fan

7 Powerplant

- Boiler Feed Pump
- CEP Pump
- Vacuum Pump
- Cooling Water Pump
- Demineralization Pump
- Gas Turbine
- Cooling Tower Fan

#AI4ProductionOutcomes

Scan to Talk to an Expert and discover how Production outcomes can be transformed

POTLINE

INFINITE UPTIME

Diagnostic Report

Equipment: FTP_52_ID FAN_2
Plant: Potline

22 Feb 2024 - 05:35pm

IUSERV101179747

Report Status: COMPLETED **Completed On:** 24 May 2024 - 10:34am

Observation
Vibration trends are gradually progressing in both Fan bearings since last one year.

Diagnostic
1. Overall vibration velocity gradually progressing in Fan DE (from 2.0 mm/s to 2.9 mm/s) and in Fan NDE (from 1.6 mm/s to 2.4 mm/s) bearings. 2. Vibration characteristics Indicates minor unbalance in fan impeller.

Recommendation
1. Inspect & clean the fan impeller for any material deposition. 2. After cleaning, if vibration levels not reduced then perform the dynamic balancing of fan impeller.

Business Impact
Downtime savings of 48 hrs

Corrective Actions Taken: In Situ Balancing

Customer Comment
Dynamic balancing implemented with addition of 1400gram.

INFINITE UPTIME

Diagnostic Report

Equipment: FTP 2 ID Fan 1
Plant: Potline

16 Jul 2025 - 10:25pm

IUSERV112894521

Report Status: COMPLETED **Completed On:** 18 Jul 2025 - 11:00am

Observation
An increase in total acceleration was observed in the FRP 2 ID Fan 1 Fan_DE side bearing with a maximum of 87 (M/s2)2 and 17 (m/s2)2 in the Fan_NDE side respectively. Significant non synchronous peaks observed in the spectrum and impacts observed in the fan NDE side bearing.

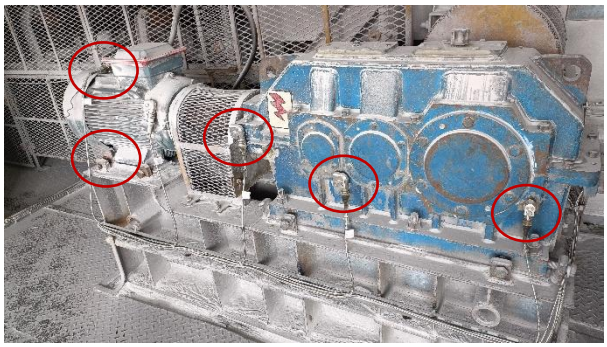
Diagnostic
Vibration characteristics indicate an inadequate lubrication condition in the FRP 2 ID Fan 1 Fan_DE and Fan NDE side bearing location. (SKF 22236 CC/W3)

Recommendation
It is recommended to flush and relubricate the FRP 2 ID Fan 1 Fan_DE and fan NDE side bearing locations as a preliminary action.

Business Impact
Downtime savings of 16 hrs

Corrective Actions Taken: Lubrication; Carry out Bearing replacement

Customer Comment
1st corrective action details: Lubrication done. 2nd corrective action details: Fan NDE Side Bearing & Housing replaced.



Potline – Belt Conveyor @ VAL Jharsuguda

Potline – ID Fans @VAL Jharsuguda

Potlines are central to Aluminium manufacturing, housing the electrolytic cells where alumina is reduced to pure aluminium. Their performance depends heavily on supporting assets such as conveyors, fans, and circulation blowers that keep raw material flow and thermal balance intact.

PlantOS™'s Prescriptive AI continuously tracks these critical systems, identifying vibration, temperature, and ultrasonic anomalies before they escalate.

Scan to Talk to an Expert and discover how Production outcomes can be transformed

HINDUSTAN ZINC
Zinc & Silver of India

INFINITE UPTIME
Production Outcomes. Delivered.

“

Partnering with **Infinite Uptime**, we have transformed asset efficiency at **Hindustan Zinc's (HZL)** mines and smelters. With over **1,900* sensors** deployed on critical machines, we have unlocked real-time predictive maintenance, **achieved $700K+ in savings**, and **gained 1945* hours of additional uptime**. This innovation, scaled with precision, delivers measurable impact where it matters most, driving operational excellence and sustainability.

-

Vedanta Spark
(Vedanta Group)

Transformation Snapshot

Hindustan Zinc Limited x Infinite Uptime

*New Data Updated as of September 17th, 2025

13
Total No. of HZL Plants Digitalized

45
Total Areas

358
Total Equipment Digitalized

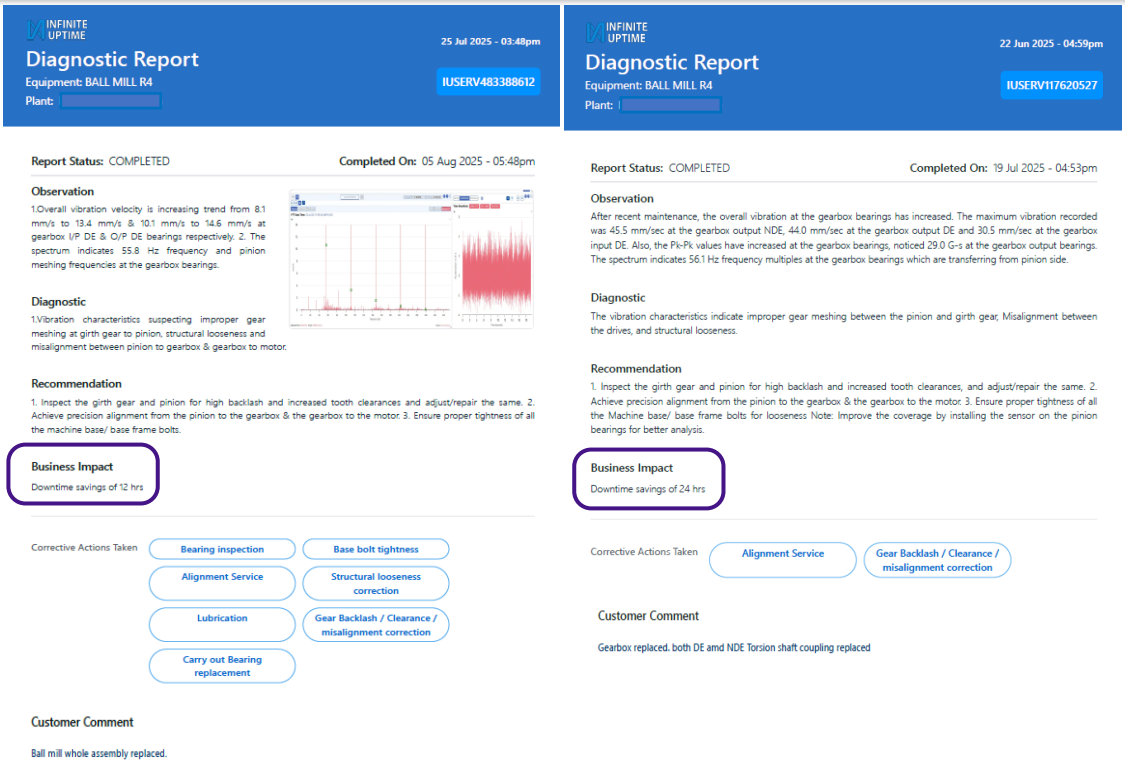
776
Total Asset

1972
Total Measurement Locations

786HRS
MTBR (Mean Time Between Repair)

Scan to Talk to an Expert and discover how Production outcomes can be transformed

BALL MILL



INFINITE UPTIME
Diagnostic Report
Equipment: BALL MILL R4
Plant:
25 Jul 2025 - 03:48pm
IUSERV483388612

Report Status: COMPLETED **Completed On:** 05 Aug 2025 - 05:48pm

Observation
1.Overall vibration velocity is increasing trend from 8.1 mm/s to 13.4 mm/s & 10.1 mm/s to 14.6 mm/s at gearbox I/P DE & O/P DE bearings respectively. 2. The spectrum indicates 55.8 Hz frequency and pinion meshing frequencies at the gearbox bearings.

Diagnostic
1.Vibration characteristics suspecting improper gear meshing at girth gear to pinion, structural looseness and misalignment between pinion to gearbox & gearbox to motor.

Recommendation
1. Inspect the girth gear and pinion for high backlash and increased tooth clearances and adjust/repair the same. 2. Achieve precision alignment from the pinion to the gearbox & the gearbox to the motor. 3. Ensure proper tightness of all the machine base/ base frame bolts.

Business Impact
Downtime savings of 12 hrs

Corrective Actions Taken
- Bearing inspection
- Base bolt tightness
- Alignment Service
- Structural looseness correction
- Lubrication
- Gear Backlash / Clearance / misalignment correction
- Carry out Bearing replacement

Customer Comment
Ball mill whole assembly replaced.

INFINITE UPTIME
Diagnostic Report
Equipment: BALL MILL R4
Plant:
22 Jun 2025 - 04:59pm
IUSERV117620527

Report Status: COMPLETED **Completed On:** 19 Jul 2025 - 04:53pm

Observation
After recent maintenance, the overall vibration at the gearbox bearings has increased. The maximum vibration recorded was 45.5 mm/sec at the gearbox output NDE, 44.0 mm/sec at the gearbox output DE and 30.5 mm/sec at the gearbox input DE. Also, the Pk-Pk values have increased at the gearbox bearings, noticed 29.0 G-s at the gearbox output bearings. The spectrum indicates 56.1 Hz frequency multiples at the gearbox bearings which are transferring from pinion side.

Diagnostic
The vibration characteristics indicate improper gear meshing between the pinion and girth gear, Misalignment between the drives, and structural looseness.

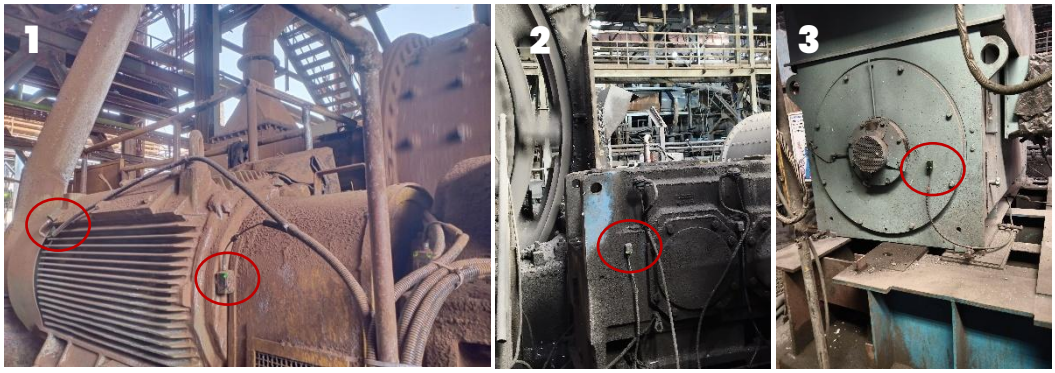
Recommendation
1. Inspect the girth gear and pinion for high backlash and increased tooth clearances, and adjust/repair the same. 2. Achieve precision alignment from the pinion to the gearbox & the gearbox to the motor. 3. Ensure proper tightness of all the Machine base/ base frame bolts for looseness Note: Improve the coverage by installing the sensor on the pinion bearings for better analysis.

Business Impact
Downtime savings of 24 hrs

Corrective Actions Taken
- Alignment Service
- Gear Backlash / Clearance / misalignment correction

Customer Comment
Gearbox replaced. both DE amd NDE Torsion shaft coupling replaced

With PlantOS™'s- Advanced Sensing technology, Collaborative AI, and 24x7 human intelligence monitoring the Ball Mill round the clock, detecting subtle increases in acceleration, temperature, and vibration that signaled early-stage defects.



2 & 3

Ball Mill @
HZL Rampura

1

Ball Mill @
HZL Dariba

The Ball Mill is critical in Aluminium manufacturing for grinding and pulverizing raw materials into fine particles. This process enhances metal recovery, improves mixing, and ensures consistent quality for downstream production.

Scan to Talk to an Expert and discover how Production outcomes can be transformed

PlantOS™

The World's most user-validated Prescriptive AI

vSense 3XT
Piezoelectric Triaxial

vEdge 3XTRPM
MEMS Triaxial

vSense 1XT
Piezoelectric Uniaxial

With the absolute success of PlantOS™ across diverse Vedanta Plant sites, the vision for semi-autonomous manufacturing moves rapidly from possibility to reality. The existing deployment of advanced MEMS and Piezoelectric sensors at Vedanta has already enabled real-time monitoring of critical rotating equipment, stretching reliability and intelligence to cover a wide-spread link in the production chain.

The next phase will see an expansion to miniature piezoelectric sensors—compact in design and enhanced in capabilities—extending PlantOS™ coverage even further and deepening prescriptive AI control across the value chain.

vSense 3XTURPM
Mini-Piezoelectric Triaxial
ultra with temperature

Looking ahead, Infinite Uptime's Corrective Action Services—ranging from NDT Balancing to Alignment and Thermography—will unlock full-spectrum **prescriptive maintenance**, while Vedanta's increased focus on **energy efficiency** signals a future of truly optimized operations.

PRESCRIPTIVE Maintenance

ENERGY Efficiency

Goal Setting → **Baseline** → **Benchmark** → **Optimize** → **Collaborate**

#AI4ProductionOutcomes

Scan to Talk to an Expert and discover how Production outcomes can be transformed

As of 17 September 2025, PlantOS™ has generated over 29,757 prescriptions across industries such as steel, cement, mining and metals. In just Q2 of this year (01 April–30 June 2025), the ratio of prescriptions acted upon versus those generated stood at an exceptional 99% (4,081 executed out of 4,116 issued). This represents the highest publicly reported volume of user-validated AI prescriptions delivered and executed within a single quarter.

Together, Infinite Uptime and Vedanta are committed to setting new benchmarks, driving continuous value creation, and shaping the next era of leadership in smart manufacturing.

Goodbye Dashboards,

Hello Outcomes!

Talk to an Expert Today!

#AI4ProductionOutcomes

www.infinite-uptime.com