

Local AI Deployment for Coal Power Plants

Scope, safeguards, and operational boundaries of deploying on-premise AI systems for enhanced safety, reliability, and compliance.

100%

On-Premise

Advisory

Non-Intrusive

Compliant

Audit-Ready



Supportive, Advisory and Non-Intrusive

KEY PRINCIPLE

All operational decisions remain with plant staff

The AI assists by analyzing operational data.

Advisory Only

No control commands or setpoint changes

Data Analysis

Analyzes operational data for insights

Early Warning System

Provides proactive alerts

Compliance Preserved

Safety procedures unchanged

Local System Integration

AI deployed locally, interfacing only with existing monitoring systems

READ-ONLY

DATA SOURCES

DCS
Control System

SCADA
Supervisory Control

Historian
Data Archive

OXMAINT AI ENGINE



Local Processing

On-Premise | Air-Gapped | Secure

INSIGHTS

ANALYSIS SCOPE

Alarms and Events
Pattern Analysis

Trends
Anomaly Detection

Maintenance
Record Correlation

Operational Philosophy Preserved

Deployment aligns with established power plant safety principles

Human-in-the-Loop

Operators retain full control. AI provides recommendations only when requested.



OPERATOR AUTHORITY

Conservative Approach

Recommendations err on caution. Safety-critical decisions prioritize conservative outcomes.



RISK-AVERSE BY DESIGN

Defense-in-Depth

AI adds supplementary analysis without replacing existing safety systems.



LAYERED PROTECTION

Secure by Architecture

CORE PRINCIPLE

Zero External Data Transmission

All processing occurs within plant network. No data leaves plant boundaries.



Compliant With
IT/OT Cybersecurity Guidelines

Access Controls

Role-based permissions with strict authentication

Audit Logs

Comprehensive logging of all activities

Network Segregation

Air-gapped from external networks

On-Premise Only

All infrastructure within plant premises

Data Encryption

End-to-end encryption at rest and in transit

Read-Only Interface

No write access to control systems

Enhanced Support, Not Replacement

WORKFORCE RESPONSIBILITY

AI **reduces manual analysis** but **does not replace** licensed operators.

ACCOUNTABILITY

Responsibility remains with **designated plant personnel**.

Licensed operators and engineering oversight preserved



PRACTICAL OPERATIONAL BENEFITS

Early Issue Identification

Detect developing equipment issues before escalation

Reduced Forced Outages

Minimize abnormal events through predictive insights

Improved Alarm Handling

Consistent alarm analysis across shifts

Enhanced Traceability

Complete audit trail for operational decisions

Transparent and Traceable

AUDITABILITY FEATURES

Timestamped Logs

All AI insights logged with precise timestamps

Data References

Clear linkage to source data for every recommendation

Audit-Ready

Transparent review during inspections



CONCLUSION

An Incremental Enhancement to Existing Practices

By remaining advisory, transparent, and confined within plant boundaries, the system strengthens safety and compliance.



Advisory

Decision Support

Transparent

Explainable

Confined

Within Plant

SCHEDULE A DISCUSSION



Ready to Enhance Your Plant Operations?

Contact our team to discuss how Oxmaint AI can support your operational and compliance objectives.

Contact us for a detailed discussion:



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