CASE STUDY

Transforming Alarm Management for Malaysia's National Grid with Asset Intellect

At a glance

Industry
Transmission & Distribution

Product
Asset Intellect & Alarm Sentinel

This case study features Tenaga Nasional Berhad (TNB), Malaysia's largest electricity utility and the cornerstone of the nation's power infrastructure. As the primary electricity provider across Malaysia, TNB operates an extensive transmission network spanning over 400 substations energized at 132, 275, and 500 kV levels. The utility maintains critical international interconnections through 132 kV HVAC and 300 kV HVDC transmission lines to Thailand, and 230 kV cables to Singapore, ensuring regional energy security and grid stability across Southeast Asia. The company is also a leader in digital transformation, exploring innovations such as autonomous equipment, advanced analytics, and integrated remote operations.

Challenge

TNB's control rooms were inundated with excessive alarm rates that included numerous chattering alarms, communication losses, and suspect data quality issues. This flood of information made it extremely difficult for operators to identify and prioritize the alarms that truly required immediate attention. The situation was further complicated by the organizational separation of Operations and Asset Management functions, which created significant barriers to accessing critical alarm and event information outside the control room network.

When TNB's Grid Division was tasked with managing their own alarms independently as part of organizational restructuring, they recognized the need for a dedicated solution that could provide the same level of operational insight previously available through the control room SCADA system. While the PI system served effectively for data management and analysis, TNB identified that a specialized alarm management platform would be required to fully support their asset management objectives and operational requirements.

This organizational change presented TNB with an opportunity to enhance their operations through better system integration. While TNB had invested in multiple specialized systems that each performed specific functions well, they recognized the potential to create more powerful operational insights by connecting data from across their entire technology infrastructure.

TNB needed a sophisticated, automated solution that could organize alarm data in a way that made sense for asset management while connecting their existing systems including PI, OMS, Automatic Fault Analysis, Qlik Sense, cameras, and weather mapping. Given the scale of TNB's grid operations, the solution would need to efficiently support hundreds of users with different needs and timeframes while maintaining the fast, reliable performance that TNB's operations required.

> "Empowering smarter monitoring and faster action; the ICECOMS Project marks a major step forward in achieving our Division Alarm Management objectives."
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> **Nik Rashidah, Asset Modeling Engineer**

Solution

TNB evaluated potential approaches, including internal development, to select the most effective solution for their operational requirements. Through this assessment, TNB chose Asset Intellect and Alarm Sentinel, as we offered off-the-shelf, well-engineered products that achieved, and exceeded their operational requirements.

Alarm Sentinel provided comprehensive automated alarm management through sophisticated sorting and filtering capabilities that organized alarms into asset-oriented views. Using TNB's existing tag naming conventions and descriptors, Asset Intellect built dynamic, filtered views for various use cases and time ranges, serving hundreds of users simultaneously while maintaining exceptional responsiveness and enabling rapid alarm analysis.

Asset Intellect & Alarm Sentinel seamlessly integrated with TNB's existing infrastructure, connecting PI, OMS, Automatic Fault Analysis, Qlik Sense, cameras, and weather mapping systems to eliminate information silos.

With over **400 substations** generating excessive alarm rates, **Asset Intellect** delivers **automated filtering** & **asset-oriented views.**

Asset Intellect & Alarm Sentinel also incorporated robust data quality analysis capabilities, performing daily assessments across large numbers of tags to ensure information reliability and prevent the suspect data issues that had contributed to the original challenges.

Results

The implementation transformed TNB's alarm management across Malaysia's national electricity grid, delivering alarm information in near real-time to all key personnel with data contextually organized according to their operational responsibilities. This enabled data-based decision-making from fully integrated information across multiple systems, eliminating the coherent view challenges that had previously constrained operational effectiveness.

Asset Intellect has positioned TNB to transition toward condition-based maintenance approaches, offering potential for increased asset reliability while reducing maintenance costs through targeted scheduling based on actual asset condition. Automated notification capabilities ensure appropriate personnel receive alerts under specific conditions without manual intervention, significantly improving response times while reducing operational burden on control room staff.

The daily data quality analysis has substantially improved information reliability, ensuring operational decisions are based on accurate, verified data. Alarm Sentinel’s exceptional responsiveness and rapid alarm analysis capabilities have transformed how TNB's operational teams interact with critical infrastructure data, establishing a foundation for continued operational excellence across Malaysia's electrical grid infrastructure.