An ABB control solution has delivered significant cost savings at an Indian hydropower plant by providing state-of-the-art HMI (human machine interface) to existing control system hardware, helping the customer avoid an expensive control system retrofit.

The Ranganadi hydroelectric plant is a 405 megawatt (MW) generating facility on the Ranganadi River in Arunachal Pradesh, northeastern India. A 68 meter tall dam diverts water south into a 10 km long headrace tunnel after which it finally reaches three 135 MW turbines. It is one of five hydro plants operated by the state utility, North Eastern Electric Power Corporation Limited (NEEPCO), which oversees 1,130 MW of installed capacity.

The mountainous region of Arunachal Pradesh has the highest hydropower potential in the country, according to the government of India, with an estimated total potential power output of 26,756 MW, at 60 percent load.

The Ranganadi generation plant uses an ABB Procontrol P13/42 control system to auto sequence the operation of its three turbines. Plant operation was enabled completely through the backup panel - there was no HMI - which created difficulties for operation and maintenance, trip analysis, fault finding, etc., and provided no way to implement preventive maintenance steps.

Rather than a complete revamp of the control system with the latest hardware, ABB assured NEEPCO that it would

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<th>Project name</th>
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<td>Location</td>
<td>India</td>
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**ABB solution**
- Commitment to support P13/42 control system at least for the next 15 years, with spares and life cycle support
- Introduced Symphony Plus state-of-the-art S+ operation HMI while retaining the existing control system
- Introduced Windows based engineering and diagnostic tool

**System benefits**
- Huge cost saving by avoiding total control system retrofit while achieving the much needed ease in maintenance
- HMI implementation carried out during maintenance outage of the unit, avoiding major generation loss
- Ease in Operation & Maintenance, reduced downtime and increased in efficiency
support the Procontrol P13/42 control system for at least the next 15 years with spares and lifecycle support. In addition, a ready-made connectivity solution integrating Procontrol P13 into ABB’s Symphony Plus control system let the customer keep the existing control hardware and also install a state-of-the-art HMI system.

The new Ranganadi HMI system features two Symphony Plus servers (one operating during runtime; the other on cold standby mode) and three operator stations, one for each generating unit. Together with the latest windows-based engineering and diagnostic software, the ABB solution enables effective plant operation and maintenance, fault finding, trip analysis and even preventive maintenance.

Symphony Plus’ flexibility allowed for easy implementation of specific functions and customized software on-site for improved operability of all 204 custom-implemented drives.

The ABB solution represents significant cost savings for the customer because it avoids a total control system retrofit, while simultaneously delivering the desired objective of easier maintenance. ABB carried out the HMI implementation during the unit’s planned maintenance outage, avoiding the loss of additional generation revenue. In addition to the cost savings, and greatly improved plant operation and maintenance capability, ABB’s solution also reduces downtime and increases efficiency.

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