



A new housing trend

Customized electrical houses are now being delivered with fully integrated electrical and automation systems

ANDREAS RENULF, J. PAUL SINGH – Traditionally oil and gas and engineering, procurement and construction (EPC) companies received their switchgear, drives, periphery distribution equipment and automation systems from multiple electrical equipment suppliers and obtained the electrical house from a fabricator. But the need to reduce risk, costs and delivery

time has steered the industry away from this practice. Today, there is a clear trend toward delivering an integrated, installed and precommissioned electrical and automation system together with the complete electrical house. ABB has just the right portfolio to meet this demand and has already delivered many such installations.



For many companies, it is no question that there is a great advantage to using one supplier for multiple products. In the oil and gas industry, electrical equipment – including switchgear → 1, drives, distribution equipment and automation systems – has traditionally been supplied by multiple vendors. What's more, the protective electrical house in which all of this equipment must reside has typically been provided by yet another vendor. Inherent in this setup is the potential for increased risk of integration errors, higher costs and longer commissioning times.

A single vendor capable of engineering, designing, assembling, packaging, testing and delivering the equipment, as well as managing the fabrication of the electrical house, is the key to reducing these risks, costs and commissioning times, and improving project capex (capital expenditures).

Reducing risk

With conventional supply of equipment to an EPC or oil and gas company, multiple suppliers are involved. This means that, even with any minor change to the electrical loads, there will be a ripple effect of changes to, eg, the switchgear, drive torque, number of I/Os, electrical

housing layout and air conditioning requirements, requiring the company to communicate the change with each supplier, as well as with the electrical house fabricator, who must then make the appropriate changes. The risk of errors associated with this type of setup is high. Contracting a single vendor to supply the equipment and manage the electrical house can mitigate this risk.

Reducing costs

Costs can be incurred in any number of ways. And when it comes to the supply of electrical and automation systems, one of the quickest ways to incur them is by using multiple suppliers who must then install the equipment at quite often remote locations.

With a single-vendor setup, the complete system is shipped fully functional and ready to go; once the equipment arrives on-site, it has already been built and tested and must only be "plugged in." Further, the prefabricated enclosures or electrical houses → 2,3 can be shipped as modules, requiring only a small amount of on-site assembly. If there are changes in the electrical loads during engineering, the inherent subsequent changes must not mean additional financial burden since this is handled centrally by one supplier. In addition, the reduction in on-site work results in significant financial savings.

Reducing delivery time

The traditional multivendor approach to equipment delivery demands that the electrical house must be complete before the products can be delivered, installed, cabled and commissioned. With prefabricated electrical houses, this can be done in parallel and the working sys-

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tem can be delivered to the site in one package, reducing the amount of time required for the delivery and installation process.

Weight and size are key factors when the electrical house is installed on an offshore platform or as a module on top of a floating, production, storage and offloading (FPSO) vessel. This makes the interaction between the switchgear man-

Title picture

Offshore electrical house (foreground)

ufacturer and the electrical house fabricator even more crucial since there is no room in the electrical house to accommodate changes to the switchgear.

Single suppliers across industries

Some large EPC companies in Japan in particular have lost a significant amount of money as a result of overruns in on-site work. Consequently, these companies have recently begun to use the single-supplier approach where one supplier also oversees the fabrication of the electrical house. Other industries are using this approach as well. The minerals industry is also motivated to reduce the need for on-site work since the mines are often located in remote areas where qualified personnel can be hard to recruit. The power generation industry is also turning toward a single-supplier approach for the same reason – power plants also are often located in remote areas.

Almost all the equipment required inside an electrical house can be supplied by ABB, who installs and tests the products in the house prior to shipping. When all the different products are supplied by one vendor, the EPC or oil company has only one point of contact and one vendor who accepts full responsibility for the delivery, which reduces the risks for delay and cost overruns.

Taking on new challenges

Supplying highly efficient switchgear, drives, automation systems and the like is second nature to ABB. But for an electrical products and systems supplier, managing the electrical house fabricator is a relatively new area that involves further expertise in fields like structural engineering, HVAC engineering, fire and gas system engineering, cable scheduling and, most importantly, project management. Taking responsibility for the fabricator and accepting the added inherent risks requires all of these capabilities and more. Changes to the electrical house are inevitable and must be carefully managed. For example, if the location of the switchboards changes, so too must the length of the cable.

EPCs and oil companies are capable of managing electrical house fabrication. But turning this responsibility over to a supplier such as ABB can be a great advantage. To guarantee a successful outcome, it is essential that the electrical

2 Fabrication of an offshore electrical house



house fabricator's capabilities are known. In addition, since the cost for the electrical house can be as much as 50 percent of the complete delivery, attention is also paid to the fabricator's pricing structure. To achieve the best cost for the electrical house, ABB consolidates its purchasing powers from a global perspective.

The final, essential component following delivery is of course service. With one supplier, eg, ABB, the EPC or oil company can be assured one point of contact for any service required on all ABB products, as well as on the electrical house.

Successful electrical house delivery

Each electrical house project is a customized, engineered solution with unique requirements. Marine warranty surveys and feasibility studies for factors such as heavy lifting, preservation, sea fastening, and load-out procedures are carried out for every offshore project. ABB also has qualified, capable fabricators within Southeast Asia and China.

Experienced project proposal team

An important element for success in ABB's electrical house projects is a technically sound proposal. As stated earlier, fabrication contributes to up to 50 percent of the total contract value of an electrical house project. Including engineers with expertise in electrical houses during the proposal phase reduces both the risk in project management and the chances of variation in orders from the fabricator. These engineers can then review features such as the structure's

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weight, required HVAC, cabling (including interconnecting cabling), ladders, trays and fire and gas (F&G) systems according to specification. This approach ensures that ABB's proposal is accurate.

Effective project management team

Because successful electrical house deliveries are to a great extent a result of good project and fabricator management, and because the most affected

carried out prior to any work commencing on fabrication or customer sites. Safety standards are applied to the technical design and project planning stages to ensure compliance throughout the complete plant life cycle.

Quality

At ABB, quality is an essential component of its products and services. ABB's advanced quality management systems

span the entire business process, from responding to initial customer inquiries to delivering the final product to commissioning and after-sales service. For example, qualified quality control (QC) personnel are deployed full-time on-site during the

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industry is the oil and gas industry, there are strict project-management certification and appropriate risk-review procedures in place. An effective project management team must have experience in electrical house projects. ABB has demonstrated its strong project management capabilities in delivering large orders.

Occupational health and safety

ABB is committed to health and safety, not only out of concern for its staff and business colleagues, but also to ensure its products and engineered solutions comply with the highest standards. Comprehensive risk assessments are

construction phase. In-house quality assurance personnel develop and review all quality procedures.

Document control

Document control is an important service function implemented in all ABB projects, managing the transmission, flow and storage of all project-related documents. A document controller is assigned to manage all documents. Documentation tools such as the EDMS (electronic document management system) add value to the project and reduce the time needed for transmittal during execution.

Supply chain management

An integral member of the project team is the procurement manager, whose responsibilities include managing the supply chain, quotations, supplier evaluations and associated documentation and certification. The project manager's role includes the coordination of this procurement function to ensure effective management of project-specific materials.

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