

- WRENCH EPC online
- More success stories
- Corporate Information
- Product information
- Industry Information
- Press Room
- Contact us

BHEL's engineering projects division partners with WRENCH Global to ensure 100% accuracy in deliverables and to cut down engineering information process timelines by half.

BHEL, the largest engineering and manufacturing enterprise in India in the energy and infrastructure sector has established over 40 years ago. It ushered in the indigenous heavy electrical equipment industry in India and today manufactures over 180 products in sectors such as power generation and transmission, transportation, telecommunication, renewable energy among others.

The Project Engineering Management (PEM) Division, is one of the 19 profit centers of the company. BHEL PEM is in the business of turnkey project engineering and management, handling projects of 2000-3000 crore like power plants. In recent years, BHEL PEM has grown its portfolio from 8 projects to 28 projects running simultaneously.



WRENCH Global Success Story

Industry: EPC

Client: BHEL PEM, India





THE NEED

Each one of BHEL PEM's mega-projects is a masterpiece of complexity, dealing with thousands of tasks and documents and hundreds of vendors. The project entities involved are the multiple internal (including the 19 other BHEL units) and external groups (like customer, customer consultants and vendors). Furthermore, each of the 7000 or so tasks is broken down into about 4 or five repeating activities, and all these activities must be completed before the main task can progress.

Manual processes

In order coordinate and manage the range of processes, tasks, deliverables, schedules, and interactions that go into delivering these turnkey projects, BHEL PEM depended almost entirely on manual processes - in spite of the inevitable of delays and human error.

At a glance

Typical project scope

Project cost - Rs. 2000 crores
6000-7000 tasks
7000-8000 documents
200 vendors

Information sharing and tracking

The volume of information generated during a project is extremely high and there is a lot of interdependency between each discipline (like Civil, Control & Instrumentation, Mechanical Equipments, Piping, Electrical etc.). This means that keeping track of documents and drawings as they pass through the various stages of creation, review, inter-departmental review, approval from customer before they are released for construction was a daunting task.

SITUATION SUMMARY

Over many years of delivering turnkey engineering projects, BHEL-PEM had evolved a workable project management methodology across its many groups and divisions. These were individual-based, relied heavily on manual processes, riddled with redundancies, and did not reuse the vast project learning that had gone before.

NTPC is one of BHEL PEM's long-standing customers and is the largest power utility of India. NTPC is also the Sixth largest thermal power generator in the World and the Second most efficient utility in terms of capacity utilisation.

NEED SUMMARY

In this vast setup of manual processes, multiple

entities, high interdependencies, masses of documentation and extremely high-value customers, what was desperately needed was a **single comprehensive system** that would solve all the project-related issues and management issues at an enterprise level - not in isolated pockets of functionality, which had been attempted before and proved futile. Such a system would need to be **robust, automated, proactive, and flexible** as well as easy to use.

With this in mind, BHEL PEM called on WRENCH Global to provide a solution.

PMG - 'Managing the management'

Since the company dealt with around 28 projects simultaneously, an internal group called the Project Management Group or PMG was set up.

Interact with vendors, customers on signoff and reviews.

Monitor each deliverable and ensure final quality in delivery

Managing and tracking drawings, documents and schedules across all entities and throughout the lifecycle.

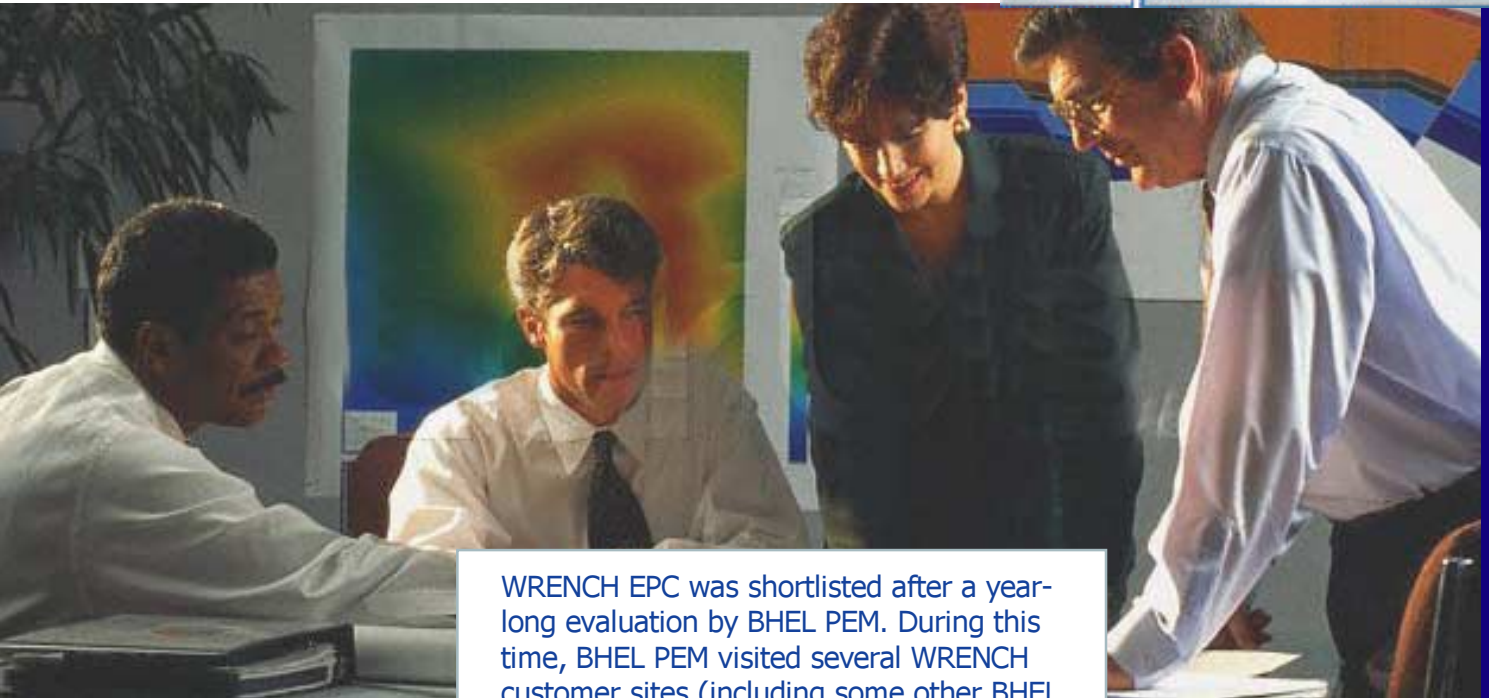
DEPARTMENTS INVOLVED

Engineering
Proposals
Project synergy Group.
Contract Management and procurement.
Quality
Human Resources
Finance.
Vigilance.
I.T

ENGINEERING DEPARTMENTS

Mechanical Auxiliary Group.
Mechanical Systems Engineering.
Mechanical Piping and Layout.
Electrical
Civil.
Control and Instrumentation.





THE SOLUTION

After multiple interactions between BHEL PEM and the WRENCH EPC team, a thorough analysis of BHEL PEM work methodologies was drawn up. Based on this analysis, the WRENCH team were able to define the following implementation objectives :

- To ensure **quality of deliverables** at every stage of design – the cost of error being so high meant huge losses in time as well as money. For example, a single design change that was not updated or shared to the right recipient could escalate in to a major issue which threatened a much larger task.
- To give the all concerned personnel - project management group, customers, department heads etc.- **instant access to the latest project data**. This would save huge amounts of time and effort, as well as eliminate the human error factor thus ensuring accuracy in the information available.
- To create a way for department heads to define L2 (departmental) and L3(sub-departmental) schedules (based on the L1 schedule that was created by the customer and the PMG). Also to **monitor the deliverables** that each schedule contained in an effective manner.
- A way to **manage the sheer volume of data** that was being generated and to be able to reuse it in future projects. To achieve this, archiving had to be an integral part of the system, not an isolated database that meant extra work to maintain.

WRENCH EPC was shortlisted after a year-long evaluation by BHEL PEM. During this time, BHEL PEM visited several WRENCH customer sites (including some other BHEL units who had implemented other WRENCH products) . After multiple interactions with the WRENCH product consultants who spent time with all the teams across BHEL PEM, a clear strategy was laid out with respect to WRENCH EPC's value add so that the customer knew exactly what to expect post-implementation.

Lastly, it was decided that the departments should be able to share project information in an easy and cost-effective manner – so that multiple groups working on the same

document could discuss and contribute in realtime.

A 3-member WRENCH team worked closely with a 2-member BHEL PEM team for 22 weeks to complete the implementation.

CHALLENGES & REQUIREMENTS

Given the sheer volume of the archives, great care had to be taken to ensure that the **integrity of the data** was not compromised. Strict security measures had to be enforced to protect BHEL PEM's IP both during and after the WRENCH implementation. In addition, since BHEL PEM is a very large enterprise, with thousands of employees, the new system had to be easy to learn and simple to use in order to facilitate quick acceptance - which in turn would ensure that BHEL PEM would realize returns on their investment as soon as possible.

Another primary requirement was to enable a judicious amount of **flexibility** into the automated systems so that delivery schedules were not compromised. This would reflect one of the advantages that the manual system had, and ensure easy adoption.



THE BENEFITS

All the defined objectives were met, giving BHEL PEM today enterprise-wide access to project information, automatic monitoring and tracking of deliverables, a foolproof way to maintain quality output, and online design collaboration in real-time. This being successfully achieved, BHEL today can look at further growth with the assurance of a strong IT support system behind it.

Specific benefits include:

Increased customer satisfaction

Post WRENCH, it is possible for BHEL PEM's customers to be much more closely involved with the project, since accurate, up to date information is so easily available. They can also now keep track of project progress without having to wait for the PMG to collect and analyse this information. Customers are therefore more confident about quality – all of which has led to improved customer relations.

Easy way to monitor deliverables and track overall project status

The PMG and department heads can now keep track of everything – from the largest teams to the smallest design detail – with the greatest of ease. It is possible for them to view, monitor and follow up on each and every deliverable online without relying on human beings as in the past. BHEL is also considering providing online access to the customer of the project status so that customers can know exactly what is going on.

Efficient use of resources

The automation of processes has eliminated the redundancy that was costing BHEL PEM a lot in time and resources.

Automatic alerts and reminders – less firefighting

Plus, any delays or disruptions, or missed deadlines are immediately identified and sent out to all relevant people under the automated alerts system that WRENCH uses to their Enterprise mailing system which is on Microsoft Outlook. This allows the managers to plan ahead and prevent any problems from escalating.

Enhanced document management

With WRENCH in place, routine tasks which earlier were time-consuming and prone to human errors are completely automated, thus saving time and ensuring accuracy. The drudgery has been removed from tasks like numbering files, storing files, retrieving the latest version, tracking changes in a document etc. The result is that the employees are able to function more proactively and not be bogged down in repetitive work that has less value. (For e.g., correspondences by mail send (As transmittal) and received from customers can be added by dragging and dropping them into WRENCH so that all information related to the project is available in WRENCH.)

Knowledge management

Now that WRENCH is running smoothly across the enterprise, BHEL PEM is able to fully exploit not only its past knowledge databases, but also plan for the future. (for e.g, The online transaction information during iterations between departments, customer, customer consultant, vendors , site engineers etc., being available in WRENCH is a repository of knowledge that can be archived for future use by indexing the information.)

Design collaboration

It was crucial that BHEL PEM teams were able to share and review designs and documents. They had to do this without disrupting the day to day working routines or having to follow up with everyone manually afterwards to ensure that the changes discussed were actually implemented properly – with WRENCH, they can now collaborate online in real-time – best of all, the changes are automatically updated and stored across the enterprise so that everyone has immediate access to the latest design and project data. Automation in sending transmittals based on workflow and updating the status based on receipt of transmittals has completely eliminated the need for a separate documentation department.



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