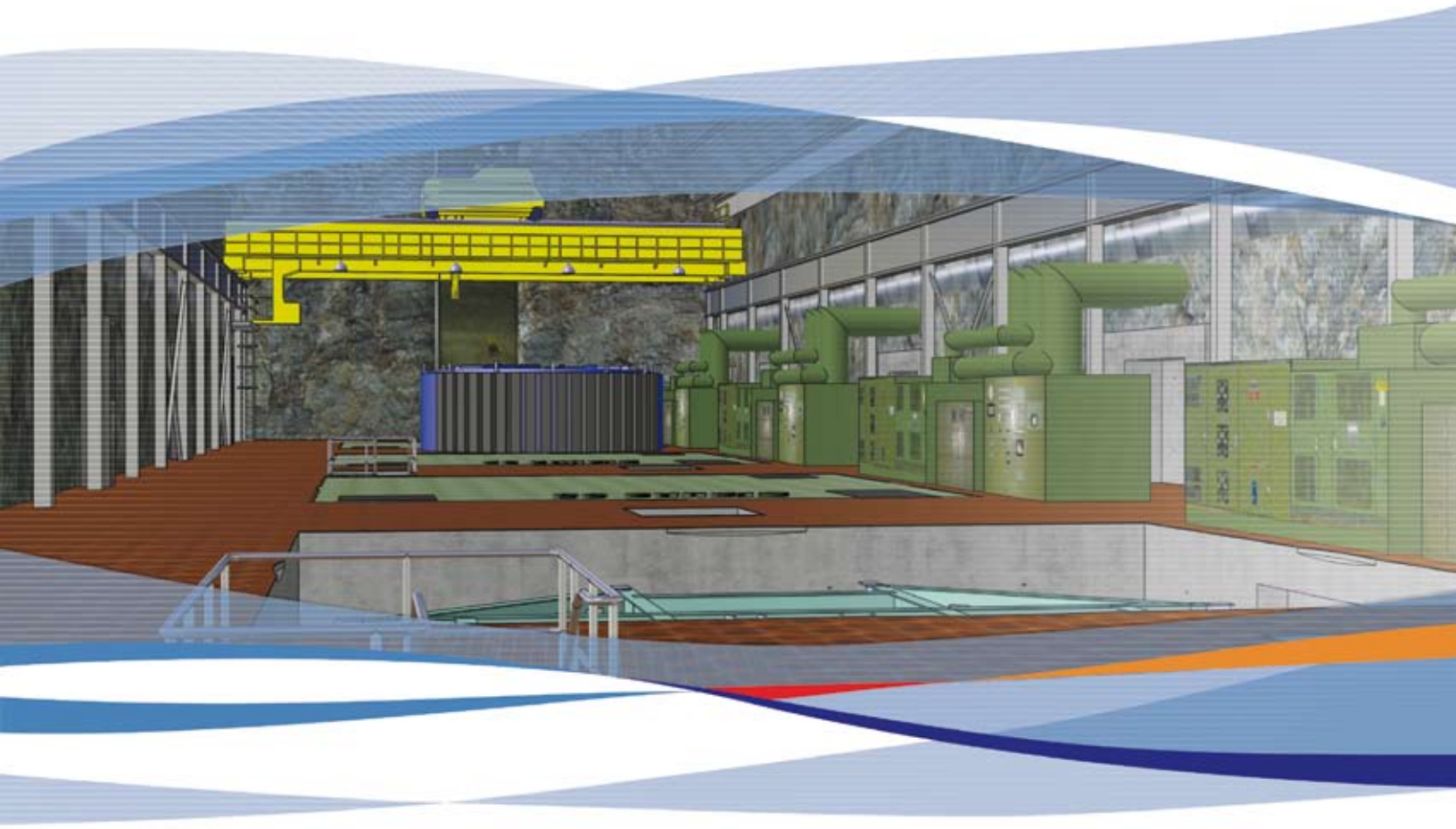
Customer
Case Study

Hydro-Québec

shortens refurbishing schedule by more than three years with PLM solutions from IBM and Dassault Systèmes



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Hydro-Québec

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Overview

The Challenge

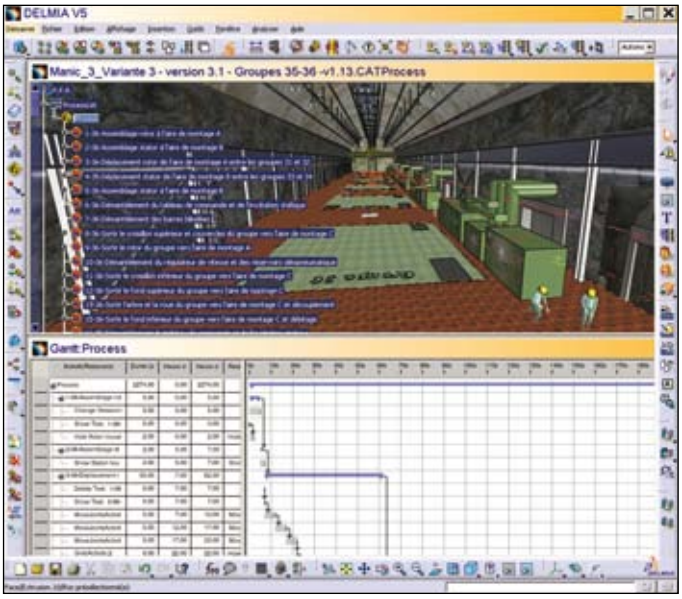
- *Hydro-Québec needed to perform a refurbishing feasibility study on its Manic-3 generating station and evaluate the cost and time it would take to perform the project.*

The Solution

- *Hydro-Québec used CATIA and DELMIA to virtually represent the plant and equipment, and to simulate the dismantling, moving and reassembly of equipment inside the plant.*

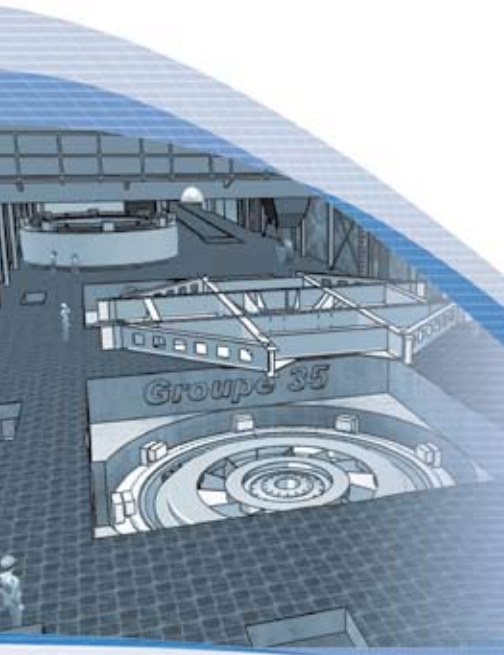
The Benefits

- *The study reduced project time by 200 weeks and saved CAN$50M, thanks to Hydro-Québec's ability to perform simulations virtually.*



Project process: Gantt Chart

Using DELMIA to optimize our feasibility study meant that Hydro-Quebec was able to reduce its project timeline by 200 weeks.



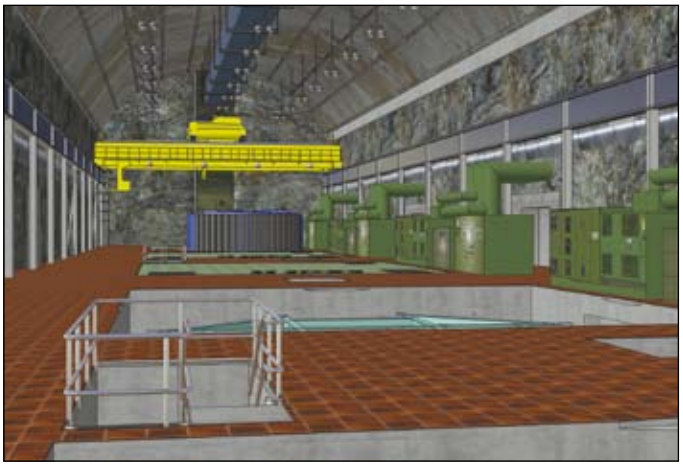
Reducing risks and costs

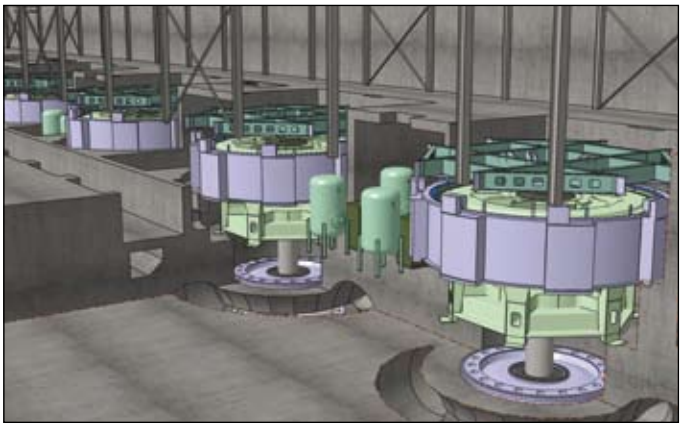
Hydro-Québec needed to assess the time and cost of refurbishing a plant of generating stations. The company used CATIA and DELMIA and the expertise of IBM PLM lab services to simulate and optimize the refurbishing of the Manic-3 plant.

A leader in hydropower

Hydro-Québec is an integrated electrical company that generates, transports and distributes almost all the electricity consumed in Québec. With more than 23,000 employees and a single shareholder (the Québec government), its generating fleet comprises 56 hydroelectric generating stations, a nuclear generating station, four conventional thermal generating stations and a wind farm, representing a total installed capacity of 35.5 GW. Over 96 percent of the power it generates is hydroelectric, making it one of the largest renewable energy producers in North America.

Hydro-Québec continually focuses on its three main priorities: energy efficiency, complementary development of hydroelectricity and wind power (the two major renewable energy sources in Québec), and technological innovation. Additionally, the company manages a number of rehabilitation projects and rigorous programs of periodic maintenance designed to optimize existing plant output and efficiency.

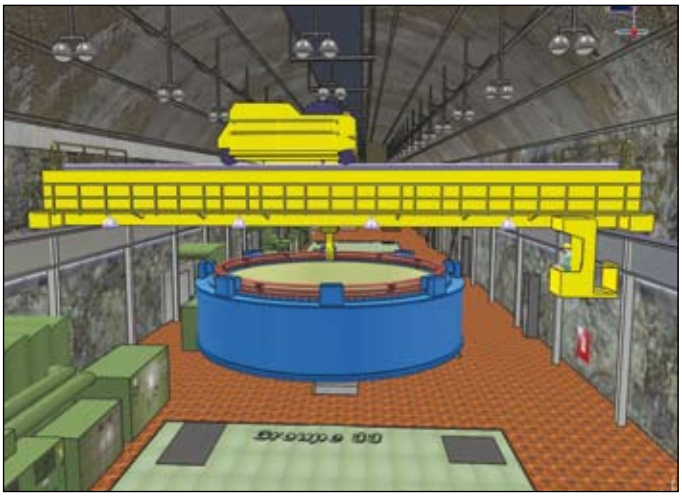


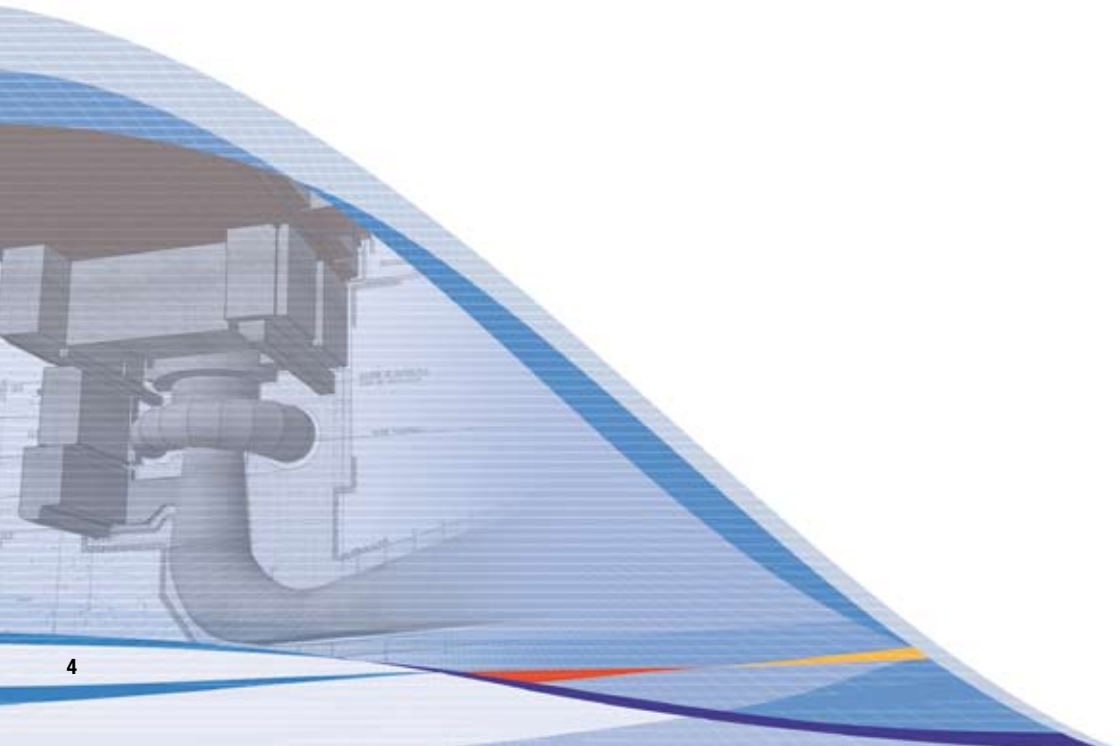


Hydro-Québec is one of the largest renewable energy producers in North America

Manic-3 refurbishing project

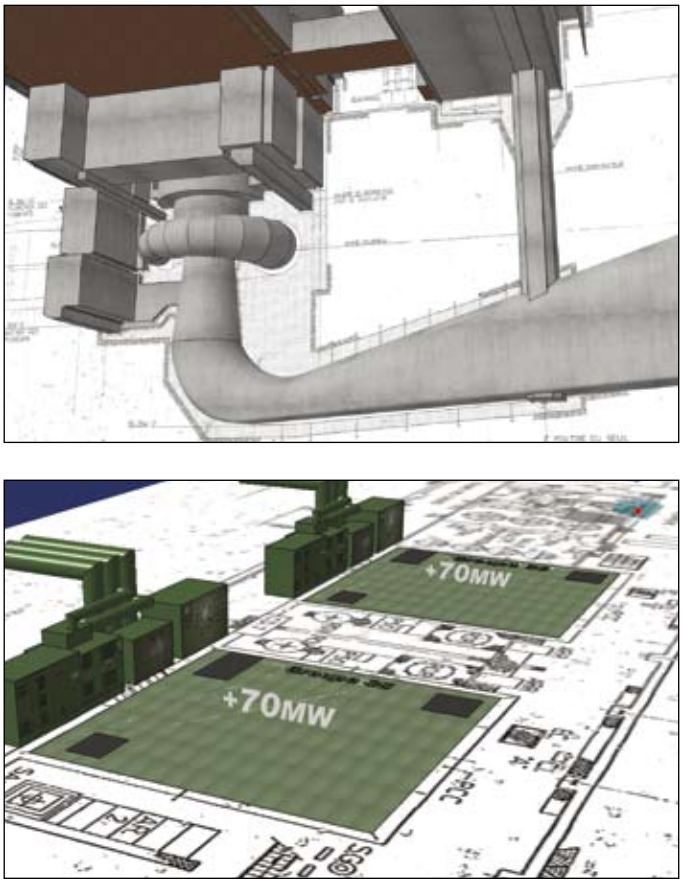
Many of the Hydro-Québec plants have been in operation for many years. Refurbishing these plants is necessary to reduce operation costs, extend plant life and optimize the energy output levels. Replacing outdated equipment and making repairs takes time and requires that a plant be taken off-line during the refurbishment. To optimize this process, Hydro-Québec decided to perform a refurbishing feasibility study on its Manic-3 generating station in a 3D virtual environment using PLM solutions from IBM and Dassault Systèmes. In this way, it could outline all the necessary project steps, foresee eventual problems and optimize each refurbishing phase before even embarking on the actual renovation.



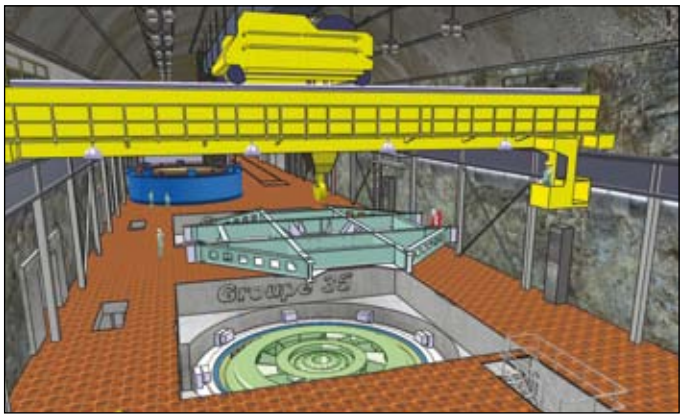


Hydro-Québec engineers had the original drawings of the Manic-3 dating back 30 to 40 years. However, improvements and repairs made to the station over the years were not necessarily documented in these original drawings. The difficulty with the refurbishing project was that no up-to-date documented view of the plant existed, Hydro-Quebec had to start from their initial 2D drawings.

The first phase of the study involved updating the powerplant drawings of Manic-3. Laser scanning was used to scan the physical plant and in only two days, a complete updated view of the interior was generated that engineers used to compare with the original drawings to see where modifications had been made. The result was a realistic 3D model of the plant's interior on which to base simulations.



Floorplans



Rotor assembly simulation

CATIA for virtual design and DELMIA for virtual simulation

For the next phase of the study, engineers used CATIA to create a virtual model of the station and all the equipment it contained. They then used DELMIA to simulate the different refurbishing tasks. The types of analysis simulated during the refurbishing study were disassembling, moving and reassembling equipment. This required strict scheduling and the necessity to ensure the safety of the employees. The flow of tasks and their sequence had to be planned because of the limited space available. Engineers simulated the disassembly of the alternator – removing its cover, removing all fixed and moving parts including the rotor, looking for the best place to set down the different parts. With DELMIA, interferences were clearly visible on screen, which helped engineers adjust the trajectory of the movement of every part. It is better to find this out during a virtual simulation than in a real situation. Each piece of equipment is a complex assembly of different parts that can weigh up to hundreds of tons. Thanks to DELMIA, engineers were able to simulate each movement with a precision of a couple of centimeters, which is exceptional for equipment of this size.

Savings of 200 weeks and CAN$50M

The refurbishing study took six weeks to accomplish with 2 resources and IBM PLM Lab Services, from the scanning phase all the way to simulation with DELMIA. Hydro-Québec removed 200 weeks from its initial planning and confirmed the real advantage in using a tool like DELMIA to optimize study projects. As a result, Hydro-Québec plans to deploy similar virtual simulations on other refurbishing projects.

Building on a solid relationship for the future

IBM PLM Lab Services has a longstanding partnership with Hydro-Québec, a 3D leader in the Energy sector, since late 2003 providing consulting, training and project management. To further leverage the current adoption of IBM's PLM Solutions, Hydro-Québec plans to extend this partnership to all steps of its projects, from design and engineering to construction. The Hydro-Québec Estimation Team already started using DELMIA to calculate the concrete volume estimation and to optimize the sequences of concrete placement. Hydro-Québec is also looking to integrate their PLM applications CATIA and ENOVIA SmarTeam with other IBM software and applications like MAXIMO.

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For more information contact your IBM Representative, IBM Business Partner, or visit the IBM PLM Web site at:

ibm.com/software/plm

Further Information

For more information, contact your IBM or Dassault Systèmes Marketing Representative or Business Partner, or visit the IBM PLM Web site at: **ibm.com**/solutions/plm or the Dassault Systèmes Web site at 3ds.com.

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