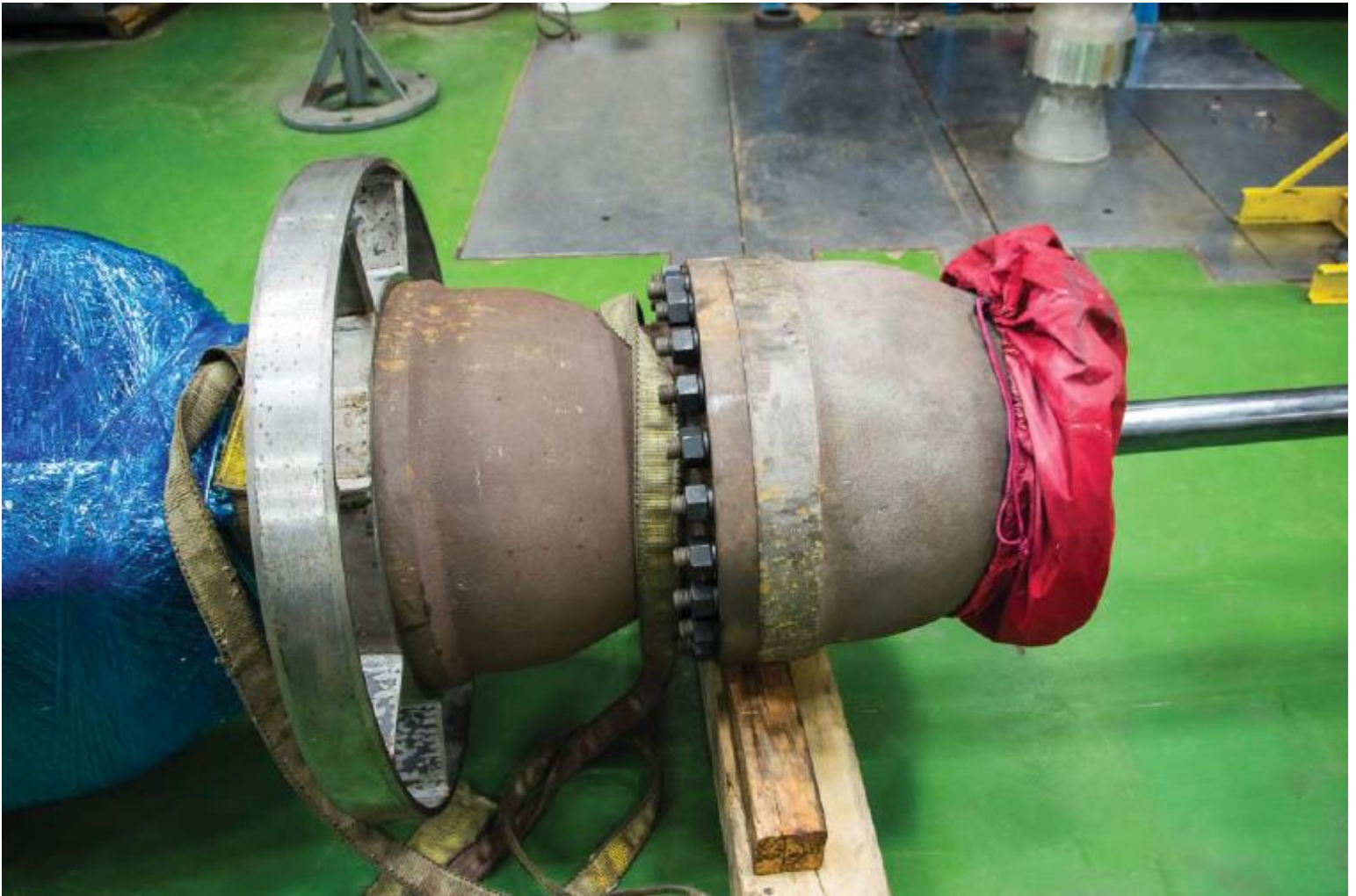




## Quality Nuclear Performance Testing in Urgent Conditions



**A 5-day emergency testing turnaround for a nuclear pump proved no problem for this world-class testing facility.**

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When a vertical safety-related residual heat-removal pump failed its required surveillance performance test at a nuclear power plant, it created the need for emergency hydraulic performance and vibration testing. The plant required the pump back in operation within one week, to prevent



shutdowns that could cost the facility up to \$1 million per day.

The plant contacted Chicago based Hydro, Inc., which has [Hydraulic Institute \(HI\) Pump Test Lab Approval \(PTLA\)](#) - certified testing facilities and the ability to perform crucial testing on an urgent basis.

## Background

During a routine check by the regulator, a safety-related heat removal pump failed its required in-house surveillance pump performance test. With a safe shutdown of the unit, the plant entered an LCO (Limited Conditions of Operation) period. The power station shut down the unit but wanted to avoid a full shutdown of the facility. This created an emergency situation for the plant.

According to the regulator's strict standards, if performance requirements are not fulfilled immediately, the plant can be shut down completely. The LCO allows the plant to continue to operate as long as the problem is being resolved in a limited time frame. In this case, the time frame was seven days. To allow for shipping to and from the facility, Hydro had only five of those days to complete the project. The plant was concerned that the repair time might exceed the LCO. Other similar pumps remained in operation performing the same function, however the unit was shut down because there were no spare pump store place it while testing was being performed. The original equipment manufacturer could not schedule the required tests in the abbreviated time span; therefore the Chicago service company was commissioned. Under normal conditions the scope of work would generally take about six to eight weeks to complete.



## Identifying the Problem

In such cases, the regulator requires that a third party inspect the equipment to discover whether the issues were with the instrumentation or with the pump itself. As a result, immediate testing was required to determine whether the pump was functional.

## Challenges

The main challenge of this project was to design and manufacture the test fixtures in the expedited time frame. Dimensional's from the pump assembly had not been provided in advance so design work could not begin until the pump was received. The five-day turnaround required 24/7 scheduling including over weekend. Once the pump was received, dimensionals were recorded, materials procured, drawings created, and manufacturing of the test fixture components could then proceed. Components included an adaptor plate, a test shaft, couplings and a column piece. Throughout the project there was constant communication between the customer and the service provider to report on progress of the work and to continually update the schedule. Because of the critical time frame two people from the nuclear plant were assigned to monitor ongoing activities at the service center.



## Inspecting the pump.

Once testing was completed, results were submitted to the plant for final approval. The pump and the



supporting documentation were both shipped to the plant within the required time frame. Testing confirmed that the pump met the regulator's standards and no pump repair or rebuild was required.

### **Customer Benefits**

The service center's experience, its in house test lab and the ability to mobilize its team quickly to meet the critical time frame prevented the plant from incurring further production losses.

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