

# Q and A

## Hope Creek 'B' Recirc Pump

A lot has been written in recent days about a recirculation pump at Hope Creek – some accurate, some not. Below, Chris Bakken, chief nuclear officer and president of PSEG Nuclear, answers some of the most commonly asked questions about the recirculation pump and its impact on the operation of Hope Creek.

### **Q. Are you replacing the 'B' Recirc Pump before starting the plant?**

A. We have decided that given all the information that we have received and based on the recommendations of both an internal and an independent expert team, we will replace the 'B' Recirc Pump in the next outage, currently planned for spring of 2006. In the meantime, we will add additional vibration monitoring equipment during this outage at the pump and reinforce several auxiliary attachments to related system equipment to create greater stability of those attached pieces. Performing that work could impact the length of our current outage.

### **Q. What did you consider in making this decision?**

A. The first thing I considered was our fundamental responsibility to "Be Safe." As I said all along, we would do the right thing to ensure that the pump would operate safely. I looked at our own engineering review and asked an independent team of industry experts to give me an assessment. Both felt that the best time to replace the pump was in the next outage.

### **Q. What did the assessments decide was occurring with the pump?**

A. The results of both assessments are similar:

- The shaft of the pump has a microscopic bow measured in mils, 1 mil being roughly the thickness of a human hair, which is causing some vibration at the pump shaft.
- The effect of the shaft vibration is on the long-term performance of the mechanical pump seal. That means that the seal needs to be inspected every refueling outage and may need to be replaced.

### **Q. Is the pump operating at a vibration level higher than the specification set by the manufacturer?**

A. No. The pump currently is operating at less than half the vibration limit set by the vendor. The B pump vibration level is currently 9 to 11 mils (with a mil being equal to roughly the width on one strand of hair). The vendor limit is 25 mils.

### **Q. Are the vibrations getting worse?**

A. No, data from monitoring over the last operating cycle of the plant indicates that there has been no increase in vibration of the pump.

**Q. What is the potential impact of these vibrations?**

A. As mentioned before, the most likely consequence of higher pump vibration would be a shortened seal life. The pump seal package is actually two seals in a series so that it is highly unlikely that there would be a failure of both seals at the same time. Seal degradation typically occurs over a period of time and can be monitored. A controlled, planned outage can be executed to replace a seal mid-cycle, if necessary.

**Q. If this was my car and I had vibrations – I would fix it. Shouldn't you just go ahead and fix the pump?**

A. Applying the car analogy, it is like taking your car to a mechanic and saying there is a rattle. The mechanic might say, "You need to fix the car right now. It's not safe." Or he might say, "The rattle is not a safety issue. Let me order the part and, when it is convenient, bring it in and we'll do the work. But if the rattle gets louder, you might want to do the work sooner rather than later." This second scenario is basically what we got from the independent assessment. The vibration level is not a safety issue, but we need to order the parts, do the planning, and fix it during the next outage. Also monitor it. If the vibrations get worse, do the repairs sooner.

**Q. Isn't this pump shaft near the end of its useful life anyway? Shouldn't it be replaced for that reason?**

A. The pump shafts are not near the end of useful life when compared to the rest of the industry. The pump shaft run hours are approximately 130,000 hours. Of the 33 original shafts in the industry, 25 have more running hours, with most being above 160,000 hours.

**Q. What specifically did the assessment recommend?**

A. Both the independent assessment and our own engineering assessment recommend similar courses of action, which include:

- replacing the pump seal in this outage;
- increasing the amount of monitoring in the system on auxiliary attachments and piping to better understand system vibrations;
- strengthening the auxiliary attachments that appear to be most susceptible to vibrations; and
- replacing the 'B' pump shaft during the next refueling outage.

**Q. Who did the independent assessment?**

A. Several independent experts in the field did the assessment. These individuals have superior credentials in pumps, piping analysis, rotating equipment performance, and vibration analysis.

**Q. Wouldn't it be prudent and safer to replace the pump now? Why wait?**

A. There is no safety reason to replace the pump shaft immediately. Had there been a safety issue, we would not hesitate to replace the shaft. I concluded that it would, in fact, not be prudent to replace the pump this outage. Doing this now would unnecessarily stress the organization. This would have presented a challenge for operations, maintenance, radiation protection and engineering -- unnecessarily stressing our organization and people. I want to give our organization the time to plan the job so that it can be carried out successfully. When we replace the shaft during the next outage, we will be in a much better position to be successful -- and that is what is most important. I am confident that we will do a better quality job with lower radiation exposure to personnel, if we wait.

**Q. What are you doing now?**

A. This outage, we are going to expand the amount of vibration monitoring in the station, in the area of the pump, system auxiliary components and piping, and we are going to strengthen some of the auxiliary attachments. We also are going to replace the pump seal. Before we start up the unit, we will be confident that we have the right monitoring equipment in the right locations, and that we can anticipate the data we expect and know what actions we will take if necessary.

**Q. Is there any pressure from the corporation to get this plant up and running sooner?**

A. We have the full support of the corporation, in terms of resources and time, to do what's necessary to improve the health of the station. The corporation has invested \$80 million in this outage to date. They are committed to the safe long-term operation of the plant.

**Q. Does everyone at the plant agree with this decision?**

A. We had pretty widespread conversations at Hope Creek about the pump, which included employees that work in operations, maintenance and engineering. Those conversations have been healthy and highlighted the decisions that we were considering and the impact of those decisions on our people and the station. I asked for these conversations since I wanted the input and I appreciate the participation of those operators, mechanics and engineers. The final decision was not unanimous, and I would not expect it to be. But, all points of view were heard.

**Q. What if you are wrong?**

A. When we exit this refueling outage, we will return a safe and robust Hope Creek to service. We will do this through careful planning, quality engineering and high-quality maintenance. And, in the end, if the data that we are collecting tells us that there is something we missed, we'll shut down the station and fix it. Because operating safely is the only way we will operate.

