

Actuator rebuilds, from teardown to inspection



Mr Knoblach, I understand you work at the Prairie Island Nuclear Generation Plant.

Where is the plant sited?

Prairie Island is located near Red Wing, Minnesota.

And what is your job there?

Well, I am a lead station electrician and my job is to help run the motor valve shop. My principal activity is to work on actuator rebuilds, which involves everything from teardown to inspection.

How many motors does your plant have?

Oh, there are probably over 300 motor-operated valves at Prairie Island. In the 8910 program we have about 160 motor operated valves. Each motor is checked on a two, three, four or five year cycle. Our plant is almost exclusively fitted with Limatorque actuators, although there may be a few exceptions in the balance of plant.

What does a rebuild entail?

In essence, we will completely teardown and rebuild the motor. Skilled personnel from various disciplines will be involved. For example, mechanics will completely disassemble the actuator. They will even strip down and inspect the drive shaft bearings. We are also very particular about how we rewire. In fact, we often receive delegations from other nuclear plants who come to learn our approach to rewiring. We even dust and clean switches and contacts. Believe me, when we rebuild a motor it looks very nice!

Is the motor then ready for use again?

No. At least, not until the motor-operated valve has passed a comprehensive set of tests. We check performance throughout the complete opening and closing cycle. Diagnostics equipment is used to ensure that the thrust and torque measurements are appropriate for the desired application.

These can be changed if necessary. At various stages, an MOV engineer will be present to check that the rebuild is proceeding as it should do.

Do you enjoy your work?

Oh, very much so. As a boy growing up on a dairy farm I was always interested in electrics and mechanical issues. So it was logical that I become an electrician. After a stint as a general electrician I joined the Prairie Island Nuclear Generation Plant about 11 years ago and have enjoyed my time here ever since. Everyone here works together as a team.

How often are rebuilds necessary?

That may be every two years, or some at 10, 12 or fifteen years. When we pull an MOV from the line we use diagnostics equipment to check its functions. Units which are up to standard can be replaced immediately. If a unit needs repairing, we see if it can be replaced with an MOV we have in stock. Then we can rebuild the first unit at our leisure. We keep plenty of spare units in stock, but obviously we may have to reconfigure the motor gears to suit the required speed of each application.

Is it true about the level of paperwork in a nuclear plant?

We do keep extensive files on all our MOVs. In fact, it may take two to three hours to complete the paperwork after every rebuild. All steps are signed off by an engineer. But that is part and parcel of our job, checking every single component is fit for purpose. When you look at it, actuators may seem simple but they do an amazing job. So seeing the final MOV go out the door is very satisfying.

