

What is Exelon PowerLabs' Parts Quality Initiative (PQI) Program?

In 2006, Exelon PowerLabs' PQI program was founded to safeguard against downtime due to critical parts failure. Exelon PowerLabs uses historic model-specific failure data trends to identify which parts to test. PQI critical characteristics testing ensures defective parts are identified before installation, reducing downtime, labor and logistics costs, and yielding substantial warranty replacement savings.

How Does PQI Work?

Step 1: Data Identifies Which Components to PQI Test

A PQI Membership includes a subscription to Exelon's web-based OneLab portal, which reveals Exelon's extensive PQI Analysis database comprised of proven PQI test plans for more than 2,000 models and historical failure trends on more than 75,000 parts.

Step 2: PQI Test Components

PQI critical characteristics testing ensures defective parts are identified before inventorying and installation, reducing downtime, labor and logistics costs. Testing newly procured parts before inventorying allows failed parts to be replaced for free within the warranty window, resulting in substantial cost savings. PowerLabs can also PQI test inventoried parts to verify older parts still perform their critical function.

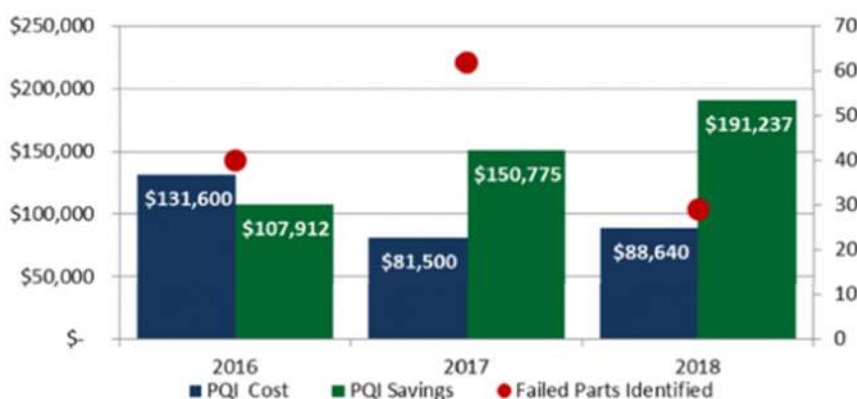
PQI Drives Efficiencies

- Reduce parts-quality related forced loss and SCRAMS to maximize power generation. PQI identified 7% deficient parts of the 75,000 parts tested through 2019.
- Gain efficiencies with existing personnel through reduced burden of SCRAM and forced loss related reporting requirements, empowering your team to focus on more important tasks.
- On average, 70% of PQI program cost is supported by identifying and replacing deficient parts while under warranty.
- Ship parts direct from manufacturer to PowerLabs resulting in time and shipping savings. PowerLabs can ship defective parts directly back to manufacturer for warranty replacement.
- Identify root cause of failure to improve manufacturer performance, procurement requirements, and/or maintenance plans.

Limerick Nuclear Power Plant Business Case Study:

From 2016 through 2018, Limerick tested almost 2,500 parts and identified a parts failure rate of 5%. Through identifying failed parts and obtaining replacements within the warranty window, warranty replacement cost savings covered a substantial portion of Limerick's PQI program investment. Examples of failed parts included cable assemblies, valve regulators, various relay types, solenoid valves, and transducers.

Limerick Annual PQI Costs, Savings, and Number of Failed Parts Identified



* In 2016, Limerick PQI tested pre-existing inventory

"Since 2017, the Exelon fleet has had zero reactor SCRAMS or MWh lost due to failed fuses, circuit cards, switches, solenoid valves, or circuit breakers as a result of implementing PQI. What is especially valuable is that the PQI program pays for itself."

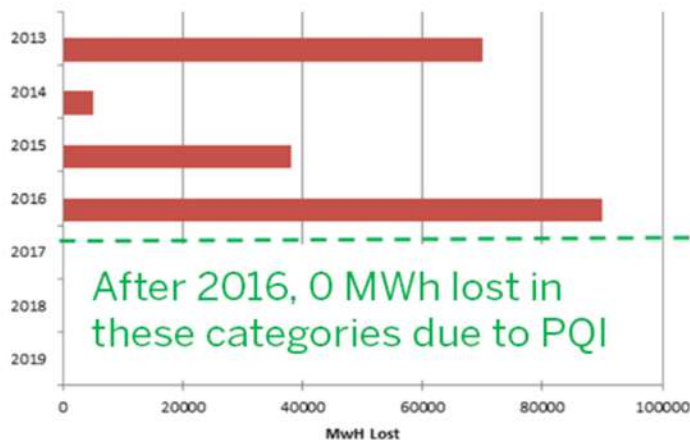
- Dan Doran, Former Engineering Director at Limerick

Exelon Nuclear Fleet MWh Lost Due to Critical Parts Failure

In 2016, Exelon added model specific fuses, circuit cards, switches, solenoid valves and circuit breakers to the PQI program. Prior to these models being added to the PQI program, these model specific critical part failures cost Exelon more than \$5 million in MWh force loss in a four-year period.

Once these models were PQI tested before installation, critical parts failure-related SCRAMS and force loss was entirely eliminated for these models.

Annual MWh Loss Due to Top Failed PQI Parts



Annual Loss*

- Fuses - \$1,770,125
- Circuit Cards - \$102,925
- Switches - \$898,250
- Circuit Breakers & Solenoid Valves - \$2,254,775

Annual Loss

\$0

*Valued at \$25/MWh

After 2016, 0 MWh lost in these categories due to PQI