



# Steam Turbine Repair Services

## *D11 HP/IP refurbished diaphragm exchange program*

**With a wealth of turbine experience, GE brings proven processes and modern technology to all aspects of diaphragm refurbishment.**

### Reliability Improvement

**Unit availability, component reliability, mitigating outage scope creep risk, and controlling outage budgets of the steam turbine fleet are key focus areas for owners. Reduced major outage inspection duration and knowing diaphragm repair costs prior to the outage starting are key value drivers of the Refurbished Diaphragm Exchange Program. The offering addresses steam path repairs including diaphragm dishing with a pre-refurbished solution.**

### Background

Technical Information Letter (TIL) 1589 was issued to address diaphragm dishing in the High Pressure and Intermediate Pressure turbine sections of the D11 combined cycle units (Fig. 1). Careful outage planning is required to ensure that addressing diaphragm dishing or other steam path repairs does not significantly impact maintenance costs, return to service dates, or long term performance and reliability.



Fig. 1. Dished diaphragm before refurbishment

### Solution

Refurbished diaphragms are available at the beginning of the outage, eliminating the need for inspection of existing diaphragms and the risk of emergent repairs which can impact the outage with added cost and can also increase duration by up to 21 days.

The process consists of five steps:

- Receive the refurbished diaphragm set prior to the scheduled outage
- Remove in-service diaphragms during outage, place in GE supplied shipping boxes
- Machine the refurbished diaphragm seal faces to optimize axial clearance

- Align diaphragms, install packing, and assemble
- Ship used in-service diaphragms back to GE within 2 weeks of installation of refurbished diaphragms

GE retains the ownership of used components removed and shipped back to GE.

Diaphragm inspection and emergent repairs normally associated with a major outage are no longer a concern.

### Key Features

- Modern repair technologies
- Enhanced weld design on applicable stages
- Creep resistant materials on applicable stages
- Steam face stock for field fitting
- New hardware kit included (excludes packing)

### Benefits

- Reduced major inspection outage cycle
- Controlled outage repair costs
- Address dishing Technical Information Letter (TIL)
- Restored axial clearances

### Offerings

Refurbished diaphragms can be purchased for

- HP section only
- IP section only
- Complete HP/IP section depending on availability (Fig. 2)

### Applicability

The Refurbished Diaphragm Exchange Program is dedicated to all D11 steam turbine units operating at 60 Hz.



Fig. 2. D11 steam turbine HP/IP rotor after diaphragm refurbishment and reassembly