



Flowserve Turnaround Services

Repair By Replacement Program

Optimize turnarounds and maximize long-term plant performance and reliability

Successful turnarounds begin long before the execution stage with smart planning. Sites around the world rely on Flowserve's engineered valve and automation expertise, innovative technology and experienced field support to solve complex turnaround challenges. Our team of expert's maximize plant performance and minimize risk - ensuring that turnarounds are completed safely, within budget and on schedule.

Flowserve Repair by Replacement Program

While our global network of service centers can address all time-sensitive repair needs, it is also important to consider repair by replacement programs in evaluating the time and cost involved with repairing older and more heavily worn valve and actuation equipment. Since the extent of repair is typically unknown until equipment inspection, it result in cost and schedule overruns. Flowserve recommends using the decision tree in figure 1 to decide replacements vs. repairs.



Flowserve Repair-by-Replacement programs can provide a viable option to minimize schedule impacts, upgrade to latest valve technology, and ensure a smooth turnaround changeout process that minimizes downtime. Benefits include:

- Reduced overall project costs (**Up to 30% savings** vs. repair of older, worn equipment) - transparent costs
- Minimized labor and logistics costs associated with repairs (**one trip to unit savings**)
- **Standardization** – optimized number of OEM equipment and components
- **Improved reliability** through replacement of older and obsolete equipment
- Compliance with latest industry standards and upgrade to newest technology including digital positioners

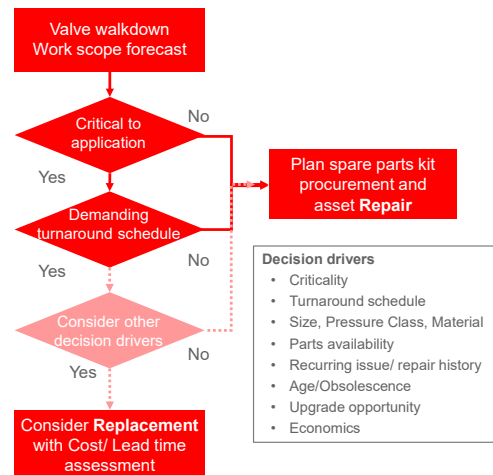


Figure 1 – Replacements vs. repairs decision tree

Repair by Replacement Program Scope

- Frame agreement established to replace valve and actuation products at attractive Turnaround project discounts
- Typically applicable for valves <6 in, class 300. Other sizes and pressure classes can be evaluated
- Up to 30% savings on small valves (<6 in) in comparison to repairing older, worn valves
- Support during turnarounds and other unplanned events including access to Flowserve quick ship program with delivery in North America and other selected regions within a week or less for control (Valtek) and on/off (Argus) valves
- Unmatched engineering and field service expertise with dedicated project management team



Repair by Replacement Program Implementation

Flowserve understands that effective planning is the single most important element of executing a successful turnaround. Our experts engage with plant personnel throughout the turnaround cycle, including the pre-turnaround phase - allowing us to better understand your turnaround goals and align resources accordingly. Implementing the repair by replacement program includes:

- Early engagement to obtain a schedule of upcoming turnarounds
- 18-24 months before turnaround – Planning, scope definition, valve walk downs
- 12-18 months before turnaround – Complete technical review, MOC & finalize proposals
- 6-8 months before turnaround - Finalize scope and issue purchase orders
- Turnaround execution including emergency repair requirements and start-up assistance

Recommendations:

- Engage at least 18-24 months before turnaround to allow for proper planning and scope definition
- Compare valves to be repaired with new valves through complete walk-down and evaluation of repair-by-replace opportunity with budget quote provided by Flowserve
- Repair by Replacement Program provides maximum benefit when coupled with a long-term maintenance contract or frame agreement
- All other time-sensitive valve repair needs can be supported through our global network of quick response centers, regardless of your location (www.flowserve.com/en/sales-locator)

