A VITAL ACTIVITY IN THE PROCESS AND POWER INDUSTRIES IS TURNAROUND / SHUTDOWN / OUTAGE PLANNING AND MANAGEMENT. DIGITAL TURNAROUND, APPLYING DASSAULT SYSTÈMES’ 3DEXPERIENCE® PLATFORM YIELDS SIGNIFICANT AND SUSTAINABLE BENEFITS IN SAFETY, RELIABILITY, AND PROFITABILITY, WHILE HELPING EXTEND THE CYCLE TIME BETWEEN TURNAroundS.

24/7 OPERATIONS, SENSITIVE TO DOWNTIME

PROCESS AND UTILITY PLANTS need to deliver reliable and safe peak performance 24/7. Plant downtime, while costly, is required for routine, scheduled maintenance and for plant turnarounds/outages. It is critical for these activities to be well planned; minimizing the time between plant shutdown and startup.

With plant production and bottom line demands escalating, there is growing pressure to accelerate turnaround projects on tighter budgets and timelines; restoring full operations as soon as possible.

Most owner operators are seeking ways to extend the cycle time between scheduled outages and turnarounds; while being assured to accomplish this both safely and reliably; while meeting KPIs.

3DEXPERIENCE® Digital turnaround planning and management solution offers substantial savings throughout the complete turnaround planning, execution, and post turnaround lifecycle.
WHY DIGITAL TURNAROUND?

In the pursuit of greater maintenance efficiency and safety during a turnaround, plant owners and operators traditionally turn to a myriad of disconnected applications and tools to plan and execute turnarounds; including: project management software, maintenance management systems, enterprise resource planning, inspection system, document management, financial system, and spares and inventory applications.

DATA DISCONNECTS LEAD TO TURNAROUND BOTTLENECKS

These standalone tools generate enormous amounts of segregated data, documents and databases; resulting in inconsistent and disconnected information and data. Constant updating and synchronizing of these data generate mismatches, and inconsistent information-flow amongst different departments, contractors and other stakeholders. This mismatch generates costly errors, while making management of change both complex and expensive.

INTRODUCING THE 3DEXPERIENCE® PLATFORM, FACILITATING EARLIER PLANT STARTUP

Naturally, every plant operator needs to startup the plant as soon as possible. There are of course constraints such as: special projects executed during turnaround, long lead spares, and work force availability, contractor performance, as well as other critical path items.

The Dassault Systèmes’ 3DEXPERIENCE® platform is designed to help prevent upcoming turnarounds from being delayed by disconnected data and knowledge inefficiencies, by aggregating turnaround data, documentation, and applications into a “single digital ecosystem”.

Powerful 3DEXPERIENCE® optimizer apps help to streamline and optimize development of work packages, and determine optimal shutdown/ restart sequencing for minimizing plant downtime. In many cases, execution shutdown time can be minimized or reduced.

SINGLE ENVIRONMENT FOR TURNAROUND MANAGEMENT

By consolidating all plant data, such as: plant designs, current as-built 2D and 3D drawings, inspection history, maintenance data, equipment/ bill of materials, operating history, and parts inventory - while bringing third-party apps, data and knowledge onto a common environment - the 3DEXPERIENCE® platform effectively connects teams to processes and automated workflows for better collaboration and efficiencies, while reducing uncertainties in communication and manpower.

VIRTUAL TWIN PLANT; FOR TURNAROUND SUCCESS

REDUCE TURNAROUND CYCLE FREQUENCY

Most owner operators today have the goal of extending the time between turnarounds. To add one year or more between turnarounds requires a solid technical foundation and good data. It requires good estimates of remaining equipment life, as well as optimizing what work needs to be scheduled now, later or can wait until turnaround. A good data foundation and digital ecosystem facilitate better analytics. An example would be looking at process operations data and its relationship to, and impact on equipment damage and remaining equipment life. It is important to bring the benefits of all useful applications such as RBI, and maintenance management into logical turnaround decision-making.

A UNIFIED PLATFORM FOR SUPERIOR MOBILITY

3DEXPERIENCE® also connects with hand held devices, smartphones, tablets, and digital hands free helmets. This capability reduces time for inspections and approvals. Creates solid audit trail of what was done/ or changed and by whom, when and why. Paper files and clipboards are virtually eliminated. This saves time, while improving accuracy and traceability.

Realtime contractor tracking improves safety while monitoring efficiency and performance. Easy to use dashboards provide alerts of potentially dangerous conditions or a worker who seems to be in trouble. Permits optimal application of the contractor workforce, and substantially reducing delays in carrying out inspections, approvals and work package completions.
Dassault Systèmes’ 3DEXPERIENCE® platform provides a comprehensive ecosystem and set of tools to aid turnaround success; including three critical features:

### Optimal Collaboration
- Boost turnaround success through immediate insight into critical turnaround factors. By leveraging a real-time data model with automated updating of project schedules, ensure turnaround issues and problems are detected early, and decisions and resolutions are accurately delivered. The Dassault Systèmes’ 3DEXPERIENCE® platform empowers better management turnarounds, applying:
  - Dashboards that provide macro and granular views for critical resources and stakeholders
  - Real-time turnaround monitoring
  - Consolidated information for cost planning and real-time cost tracking
  - Central management of contractors, worker qualifications, certifications, and activities
  - Real time contractor tracking
  - Integration of mobile devices
  - Alarms and dashboards that are user defined by the Turnaround team

### Real-Time Visibility
- Synchronize technical and schedule information across all turnaround processes to encourage better collaboration between diverse teams, with improved access, control, sharing and knowledge reuse to optimize:
  - Decision-making efficiency, based on real-time information
  - Secure document transmittal and approval
  - Audit trails with enhanced tracking
  - Efficient and accurate Change Management processes

### Integrated System
- Eliminates data disconnects, solution mismatches, and information over-complexity by centralizing mission-critical data within a common digital platform and a virtual single 2D or 3D data model, enabling:
  - Same-page planning and execution with updated information and document versions
  - Improved and optimized change management processes
  - Modeling, simulation, and optimization of the entire turnaround - from pre-planning to planning, execution through post-turnaround phases
  - Near real time cost tracking
  - Digital permit to work
REDUCE COMPLEXITY AND DOWNTIME TO BOOST UPTIME, SAFETY, RELIABILITY, AND PROFITABILITY

Increase plant productivity and accelerate turnarounds by digitally enabling the turnaround cycle with the Dassault Systèmes’ 3DEXPERIENCE® platform.

Benefits include:

- **Enhanced collaboration and decision making**: Intelligent dashboards provide a holistic view of the turnaround execution and enhance collaboration between internal and external stakeholders, reducing data review time and improving decision making.

- **Increased data quality, control and compliance**: Streamlined digital work processes to reduce/eliminate paper flow, with electronic signatures and audit trails ensuring traceability of transmittals and regulatory compliance.

- **Improved productivity and accuracy**: Reduced manual data entry and data processing to achieve better plant reliability and availability, improved data quality, faster response times and proper allocation of resources.

- **Raise HSE and compliance levels**: Help to improve Health, Security, Safety, and Environment (HSE) levels for workers to minimize accidents in designated high-risk areas, with:
  - Agile workload scheduling
  - Varied and accurate simulations
  - Clarity of certification processes and rating of subcontractors
  - Standardization of the validation of subcontractor employees
  - Digital Permit-to-Work

**SCHEDULE A DIGITAL TURNAROUND BUSINESS VALUE ASSESSMENT WORKSHOP**

Email APS.Marketing@3ds.com to schedule a Dassault Systèmes Digital Turnaround Assessment workshop at your office or plant site.

Dassault Systèmes turnaround consultants typically having 20 or more years of plant turnaround experience speak the same language.

This 1 to 3 day workshop comprises a full assessment of how digital turnaround will benefit your specific plant’s turnaround requirements.

- Turnaround objectives
- Current turnaround “as is”
- Desired turnaround “to be”
- Discussion of the Turnaround planning and execution cycle
- Turnaround KPI’s
- Possible areas for improvement
- Benefits of Digital Turnaround Planning and Management

Our 3DEXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes’ collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 220,000 customers of all sizes in all industries in more than 140 countries. For more information, visit www.3ds.com.