

WHITE PAPER

Rethinking Shutdown, Turnaround & Outage Management

How integrated planning, SAP® connectivity, and purpose-built applications are transforming large-scale refinery turnarounds.



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FOREWORD

From Sathyanarayana Singh — VP & Head IT (Refinery, Marketing and Corporate), Nayara Energy Limited

At Nayara Energy, operational excellence is built on reliability, safety, and disciplined execution. As one of India's largest and most complex refining operations, our Vadinar refinery processes approximately 20 million metric tonnes of crude oil annually. Maintaining such a facility requires rigorous planning, seamless coordination, and complete visibility across every stage of the asset lifecycle.

Shutdown, Turnaround & Outage (STO) management is a critical component of that responsibility. Beyond maintenance, it is the mechanism through which we safeguard asset integrity, ensure regulatory compliance, optimise operational performance, and prepare the refinery for sustained production in the years ahead.

As part of our continuous improvement journey, we undertake a comprehensive review of our STO planning and execution landscape. While our teams possessed deep expertise and robust processes, fragmented information across systems limited end-to-end visibility and constrained decision-making. The opportunity was clear: create a connected planning environment that would enable greater collaboration, transparency, and execution discipline.

The implementation of Procify STO Manager marked a significant step in that direction. By integrating Primavera P6 execution schedules with SAP planning and maintenance data, Nayara Energy established a unified platform for planning, monitoring, and managing turnaround activities in real time. The result is a more connected, data-driven approach that strengthens governance, improves reporting visibility, and enables faster, better-informed decisions.

This white paper captures the journey, lessons learned, and outcomes of that transformation. More importantly, it demonstrates how digital integration can help Nayara as an organisation improve STO performance while enhancing safety, efficiency, and operational resilience.

We hope the insights shared here will serve as a useful reference for organisations pursuing similar objectives in their own turnaround and asset management programmes.

Executive Summary

Shutdown, Turnaround & Outage (STO) programmes are among the most operationally and financially consequential events in any large refinery's calendar. At a facility processing 20 million metric tonnes per annum, a single STO cycle can involve more than 16,000 individual activities, hundreds of contractors, and a planning horizon measured in years. The margin for error is negligible; the cost of overrun is significant.

Yet across India's refining sector — and the broader Oil & Gas industry — STO planning maturity remains uneven. Many organisations continue to rely on fragmented toolsets: standalone scheduling applications with no enterprise system connectivity, Excel-based planning workbooks that cannot scale, and manual reporting cycles that deprive leadership of real-time visibility precisely when it matters most.

This white paper, co-authored by Nayara Energy and Maventic Innovative Solutions, examines the structural gaps in conventional STO management practice and presents a framework for closing them. It draws on Nayara Energy's experience deploying an integrated STO management solution — Procify STO Manager — across the Vadinar refinery, one of Asia's most complex downstream facilities.

The paper is structured for CIOs, VP Operations, and Plant & Site Managers evaluating how to modernise their organisation's approach to turnaround management. It offers both a diagnostic maturity framework and a practical reference architecture for organisations ready to move beyond Excel and isolated scheduling tools.

Key Findings

Most refinery STO failures are **planning failures, not execution failures** — the root cause is fragmentation between scheduling, procurement, and enterprise systems.

Integrating Oracle Primavera P6® with SAP via a purpose-built connector eliminates one of the most challenging **reconciliation bottlenecks** in large-scale STO operations.

Real-time dashboards and consolidated reporting are not luxury additions — they are the primary mechanism by which **leadership can intervene before overruns occur.**

Organisations that standardise on a single platform — rather than assembling point solutions — achieve **compounding efficiency gains** across successive turnaround cycles.

SECTION 1

The Strategic Weight of STO in Refinery Operations

A refinery turnaround is not a maintenance event. It is the most capital-intensive, operationally complex, and risk-laden programme a downstream facility undertakes on a recurring basis. In a typical large refinery, an STO cycle occurs every three to four years and represents a temporary, planned shutdown of processing units for inspection, maintenance, repair, and modification. During this window, the facility is offline — generating zero throughput while incurring peak expenditure on labour, materials, and contractor services.

The financial stakes are substantial. According to the American Petroleum Institute (API), delays in a major refinery turnaround can cost upwards of \$1 million per day in lost production — and total turnaround budgets can reach \$200 million or more for large-scale facilities.

Source: American Petroleum Institute, cited in AMACS, "Understanding the Differences: Shutdowns, Turnarounds, and Outages," 2025.

The Planning Challenge at Scale

The complexity of STO planning grows non-linearly with refinery scale. A large-scale turnaround does not simply involve more work orders than a smaller one — it involves more interdependencies, more contractor categories, more procurement channels, and more concurrent workstreams running across different process units.

The specific planning dimensions that must be managed simultaneously include:

- Scope definition and work order generation, typically initiated 18–24 months before the turnaround date
- Material procurement planning, aligned to long-lead items with lead times of 12–18 months or more
- Contractor and manpower planning, involving multiple specialist categories and regulatory compliance requirements
- Schedule development and critical path analysis, typically managed in Primavera P6 or equivalent tools
- Budget development, tracking, and variance analysis throughout the planning and execution phases
- Regulatory inspection coordination, particularly for statutory inspection requirements under the Petroleum Act, 1934, and factory legislation

Each of these dimensions generates its own data stream. The failure mode common across the industry is not that organisations lack tools — it is that the tools do not speak to each other. The result is a planning environment characterised by data duplication, manual reconciliation, and a chronic gap between the schedule in P6 and the reality in the ERP (Enterprise Resource Planning) system.

Why the P6–SAP Gap Is the Central Problem

Primavera P6 is the industry standard for project and turnaround scheduling in capital-intensive industries. SAP is the enterprise backbone for materials management, procurement, asset management, and finance in most large refineries. The two systems serve fundamentally different purposes — and in most organisations, they operate in complete isolation.

MAVENTIC PERSPECTIVE

Across our engagements with refineries and asset-intensive operators in India and the GCC (Gulf Cooperation Council), the P6–SAP disconnect is among the most consistently cited planning pain points — and among the least addressed. Organisations recognise the gap, absorb the reconciliation effort as an operational norm, and rarely prioritise closing it until a turnaround overrun makes the cost visible. The integration challenge is not primarily technical; purpose-built connectors exist. It is organisational: the gap sits between two teams — scheduling and ERP — who have historically had no shared system and no shared accountability for the data that flows between them.

A Maturity Framework for STO Planning

To help organisations assess their current position and identify where investment will have the greatest impact, this paper proposes a four-stage STO Planning Maturity Framework. The framework evaluates organisations across three dimensions: Planning Infrastructure, System Integration, and Reporting & Visibility.

Maturity Stage	Planning Infrastructure	System Integration	Reporting & Visibility
Stage 1 — Reactive	Ad hoc; no formal planning methodology. Work orders captured informally.	No integration. All data exchange is manual file transfer or phone.	No dashboards. Status obtained by asking individuals.
Stage 2 — Structured	Excel-based planning with some standardisation. P6 used for execution only.	P6 and SAP run independently. Periodic manual reconciliation.	Reports produced manually after each milestone. Lag of hours to days.
Stage 3 — Integrated	Purpose-built STO application for scoping, planning, and budgeting.	P6 integrated with SAP via an automated connector. Live data flow.	Real-time dashboards for progress, budget, manpower, S-curve.
Stage 4 — Predictive	AI-assisted scope prediction and resource optimisation based on historical data.	Full ERP integration with predictive signals for procurement and logistics.	Predictive analytics; anomaly detection; automated exception alerts.

Figure 1: STO Planning Maturity Framework

Most Indian refineries operating at large scale currently sit between Stage 1 and Stage 2. Primavera P6 is widely adopted, but its use is often limited to execution scheduling — the broader planning lifecycle remains anchored in Excel. Integration with SAP is rarely implemented in a systematic way, and reporting is almost universally a manual, retrospective activity.

The move from Stage 2 to Stage 3 — the Integrated stage — represents the highest-impact transition available to most organisations today. It does not require artificial intelligence or advanced analytics. It requires a decision to treat STO planning as a connected, enterprise-grade process rather than a collection of departmental workarounds.

Nayara's Maturity Assessment

Stage 2: The Pre-Deployment State (2022 Turnaround)

During the major refinery turnaround of 2022, Nayara Energy operated squarely within Stage 2 of the maturity framework. The organisation had established processes and experienced teams, but the technology infrastructure supporting those teams was fragmented and largely manual.

Job lists and budgeting were managed across multiple Excel spreadsheets, with consolidation required at each reporting milestone to produce job matrix summaries and budget overviews. The overhead of maintaining, reconciling, and distributing these files across teams represented a significant and recurring planning burden. Materials and services procurement was executed within SAP, but reporting on that activity remained Excel-based — meaning the connection between procurement status and turnaround planning existed only through manual aggregation.

Scheduling was performed on Primavera P6 as a standalone platform, with no integration into the broader STO planning environment. Shutdown readiness was tracked against predefined turnaround milestones, and Management Information System (MIS) reporting was produced manually by drawing on both P6 and Excel — a process that was time-consuming, susceptible to error, and challenging to deliver the real-time visibility that turnaround leadership required.

This is a state recognisable to many large refinery operators: capable people working around the limitations of tools that were never designed to function together at this scale.

Stage 3: Integrated STO Implementation (July 2023 Onward)

In July 2023, Nayara Energy implemented the STO Manager solution, marking a definitive transition to Stage 3. The deployment introduced a unified platform encompassing the modules required to manage the full STO lifecycle: Shutdown Readiness Score (SRS), job list management, budgeting, material and contract management, MIS reporting, execution dashboards, and Primavera integration.

The impact was most visible in the preparation and execution of TA 26 (Turnaround 26). Planning activity for TA 26 commenced within the STO platform, with job lists and relevant modules used as the primary working environment. The majority of TA 26 data was consolidated within STO Manager for the first time — a structural shift from the multi-file, multi-system environment of the 2022 turnaround.

TA 26 execution was monitored through the MIS module, with overall progress tracked via S-curve analysis in the execution dashboard — providing leadership with a live, consolidated view of turnaround progress that previously required manual compilation. It is worth noting that the transition to Stage 3 reflects a working, evolving implementation rather than a fully

completed one: certain reports, including material tracking and services data, continued to be managed externally during TA 26 due to data volumes and update frequency. This is consistent with the reality of large-scale enterprise deployments, where adoption matures progressively across successive cycles rather than immediately upon go-live.

Looking Ahead: The Path to Stage 4

Nayara Energy's medium-term objectives reflect the compounding nature of STO platform maturity. The focus is on deepening user adoption across all STO modules, enhancing existing functionality based on end-user feedback, and progressively bringing the remaining externally managed reporting streams into the platform.

SECTION 3

The Nayara Energy Context: Operating at India's Largest Scale

Nayara Energy operates India's second-largest single-site refinery in Vadinar, Jamnagar district, Gujarat. With a nameplate capacity of 20 million metric tonnes per annum — equivalent to approximately 400,000 barrels per day — the Vadinar facility is one of the most complex downstream assets in Asia. It processes a wide range of crude grades and produces the full spectrum of refined products, from transportation fuels to petrochemical feedstocks.

The scale and complexity of the Vadinar refinery places Nayara's STO programme among the most operationally demanding in the Indian refining sector. Each three to four year turnaround cycle involves more than 16,000 individual activities spanning mechanical, electrical, instrumentation, civil, and inspection disciplines. The programme draws on hundreds of specialist contractors, significant volumes of long-lead materials, and a planning timeline that begins years before execution.

NAYARA AT A GLANCE

Capacity

20 MMTPA (400,000 bpd)

Location

Vadinar, Jamnagar, Gujarat

Refinery Rank

2nd largest single-site in India

STO Frequency

Every 3–4 years

STO Scope

16,000+ line items per cycle

Pre-existing Tool

Primavera P6 (execution only)

Enterprise System

SAP

The State Before: A Capable Organisation Held Back by Fragmentation

Nayara Energy is a sophisticated operator with a mature IT organisation. The challenge was not a lack of technology capability or institutional knowledge — it was the absence of a connected planning architecture. P6 was in use for job-list execution, but it operated entirely independently of SAP. Scoping, planning, and budgeting were managed in Excel. Reporting was produced manually by aggregating data from multiple systems.

The consequences of this fragmentation were felt most acutely in three areas: the planning team's ability to manage scope at 16,000-line-item scale, the procurement team's ability to align material planning with the execution schedule, and leadership's ability to track progress and intervene early when deviations emerged. These are not edge-case concerns — they are the core functions of effective STO management.

NAYARA PERSPECTIVE: IMPACT OF THE PRE-EXISTING STATE

Planning and Budgeting: The Excel Burden

Before the STO implementation, shutdown readiness at Nayara Energy was monitored against predefined turnaround milestones. While this provided a broad structural framework, it offered limited real-time visibility into where the programme actually stood at any given point in the planning cycle.

Job lists and budgets were maintained in Excel, organised by unit and managed across multiple versions simultaneously. Over the course of a planning cycle spanning 18 to 24 months, this resulted in significant volumes of data stored across local machines and shared servers — an environment in which locating the authoritative version of any given file was itself a non-trivial task. Entering job-wise budgets and rolling up costs within these spreadsheets was labour-intensive and technically constrained, and the reconciliation of budget information across units and disciplines was a recurring source of effort and inconsistency.

This is a planning architecture that functions under low-volume conditions. At the scale of Nayara's turnaround programme — with thousands of line items across multiple process units — it creates compounding overhead with every revision cycle.

Reporting: The Cost of Decentralisation

The absence of a centralised MIS reporting module meant that status reporting depended entirely on a manual consolidation process. Discipline teams prepared and submitted their own reports to the central turnaround planning team, which was then responsible for aggregating, reconciling, and distributing a consolidated view to leadership.

This process carried two inherent risks that are difficult to eliminate through process discipline alone. First, the frequency of data handling — each transfer between teams representing an opportunity for transcription error or version mismatch — made data accuracy difficult to assure. Second, the time required to complete each consolidation cycle meant that by the time a report reached leadership, the underlying data had already moved on. Reporting was retrospective by design, not because the teams lacked capability, but because the architecture made real-time consolidation structurally impossible.

The consequence for decision-making was significant: turnaround leadership was routinely working from information that lagged the actual state of the programme, with limited ability to intervene early when deviations began to emerge.

Progress Tracking: The Integration Gap

Calculating overall turnaround progress and comparing planned versus actual outcomes required manual effort at every reporting cycle. Primavera P6 provided activity-level execution data, but this existed in isolation from the broader planning environment. Translating P6 data into a consolidated progress picture — one that could be read alongside budget status, manpower deployment, and shutdown readiness — required manual extraction, formatting, and aggregation.

This fragmentation made timely progress tracking genuinely difficult. The information existed across the organisation; the tools to bring it together in real time did not. The result was a planning team that was simultaneously data-rich and visibility-poor — possessing detailed records in multiple systems with no practical mechanism to view them as a coherent whole.

Reconciliation: The Recurring Overhead

Job list reconciliation was among the most time-consuming recurring tasks in Nayara's pre-implementation STO process. Updates were required from each discipline team during and after execution, and the decentralised nature of data storage meant that coordinating those updates — ensuring completeness, resolving conflicts, and producing a consolidated record — introduced delays at every milestone.

SECTION 4

The Solution: An Integrated STO Management Architecture

Maventic implemented Procify STO Manager as the primary planning and management application for Nayara's shutdown operations, delivering the integration between Primavera P6 and SAP. The solution was designed around a single principle: every data stream relevant to the turnaround should flow through one system, in real time, without manual intervention.

The Integration Architecture

The technical architecture operates across four layers:

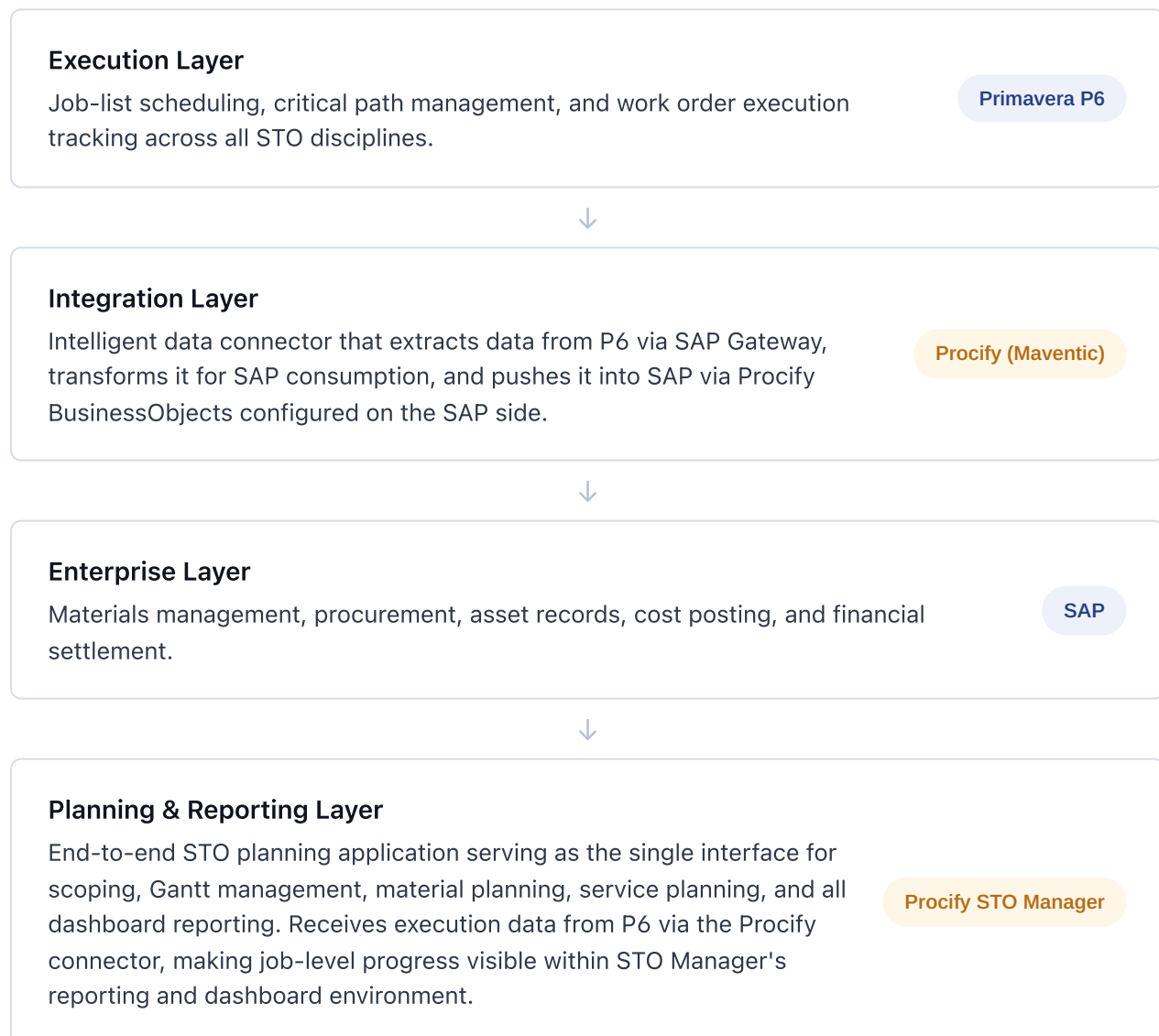


Figure 2: STO Integration Architecture at Nayara Energy

The use of Procify as the integration connector is a critical architectural decision. Traditional ERP integration projects for P6–SAP connectivity typically require significant custom development, long implementation timelines, and ongoing maintenance burden as either system is upgraded. Procify's low-code architecture allows the connector to be configured rather than coded, reducing implementation time and providing a maintainable, upgradeable integration layer that does not depend on bespoke middleware.

Procify STO Manager: Application Capabilities

Procify STO Manager served as the primary user-facing application for all planning and management activities. Its deployment at Nayara encompassed:

Planning Capabilities

- End-to-end shutdown scoping and work order generation
- Gantt chart management across 16,000+ activities
- Job list planning with discipline-level breakdown
- Service and contractor planning
- Budget development and tracking against approved baselines

Reporting & Dashboard Suite

- Completion Percentage dashboard
- S-Curve (planned vs. actual progress)
- Overall Progress tracking
- Progress Graph by discipline and work area
- MIS: Manpower deployment data visibility
- MIS: Control Matrix
- Budget utilisation and plan vs actual tracking

The reporting suite replaced a manual reporting process that had previously required significant analyst effort to compile and distribute. All dashboards are generated directly from live application data — there is no intermediate export, reformatting, or manual aggregation step.

Outcomes: What the Deployment Delivered

The Nayara Energy deployment was completed across a 36-month engagement. The outcomes reflect both the quality of the solution and the delivery team's ability to resolve issues in real time.

A Centralised Job List Portal: From Spreadsheets to a Single Source of Truth

The most immediate and broadly felt change was the consolidation of the job list into a centralised portal within STO Manager. Prior to implementation, job list data was distributed across multiple Excel files, maintained by different teams, and subject to version proliferation that made identifying the current authoritative record a persistent challenge.

The centralised job list portal replaced this environment entirely. Access is governed by role-based permissions, ensuring that the right team members can view and update data while maintaining the integrity of the record. The job list is created and revised through a structured TA job list review process, providing version control that the previous Excel-based approach could not offer.

The introduction of a standardised job list template has brought consistency to job list data across all users, units, and disciplines — a significant operational improvement at the scale of Nayara's programme. Job matrix summaries and aggregated views are now available on demand, replacing a consolidation process that previously required manual effort at each reporting milestone. The volume of email communication and file handling associated with job list management has been substantially reduced.

Streamlined MIS Reporting: Eliminating the Consolidation Bottleneck

The centralised MIS reporting module within STO Manager has restructured how reporting works across the turnaround organisation. Each discipline team now logs into the system directly and updates their reports within the module — removing the previous workflow in which discipline-specific reports were submitted to the central planning team for manual consolidation.

The effect is twofold. First, it eliminates a significant source of lag: reports are updated in the system as data becomes available, rather than after a consolidation cycle has been completed. Second, it reduces the number of times data is handled between its source and its final report — each handling step being a potential source of error or inconsistency. Both dimensions represent a meaningful improvement in reporting accuracy and timeliness.

Simplified Reconciliation: Reducing Coordination Overhead

Job list reconciliation — previously one of the most time-consuming recurring tasks in the turnaround planning cycle — has become materially more straightforward. With data centralised in a single system, each discipline team can update their records directly during execution, without the coordination overhead that decentralised data management previously required.

The complexity and elapsed time associated with reconciliation has been reduced. Updates are visible to all authorised users in real time, and the need to chase, compile, and cross-check inputs from multiple sources has been significantly diminished.

Enhanced Job Analysis Flexibility: Managing the Complexity of Live Turnarounds

One of the practical realities of large-scale turnaround management is that the job list is never static. Additional jobs are identified during execution, deferred jobs require tracking, and discovery work — arising from conditions found only when equipment is opened — must be incorporated into the planning record without disrupting the broader schedule.

STO Manager's ability to accommodate additional, deferred, and discovery jobs flexibly within a single job list — organised by WBS (Work Breakdown Structure) — has simplified the analysis and management of this inherent complexity. What previously required creating and reconciling new spreadsheet entries across multiple files can now be handled within the structured, consistent environment of the centralised system.

Centralised Data Availability: HSEF and Manpower Intelligence

The centralised platform has also improved the availability and accessibility of HSEF (Health, Safety, Environment & Fire) and direct manpower data for analysis and reference. Data that previously existed in isolated reports or had to be manually compiled is now accessible within the STO environment, supporting both operational decision-making during the turnaround and post-execution analysis.

The Manpower Demand of Real-Time Reporting

It would be incomplete to present the outcomes of this implementation without acknowledging a genuine operational consideration that Nayara has experienced. The shift to a centralised, real-time reporting environment has increased the demand for dedicated manpower for data entry. A system that provides live visibility is only as current as the data entered into it — and maintaining that currency, across a complex multi-discipline turnaround programme, requires a committed and consistent data entry effort.

This is not a limitation of the solution. It is the natural consequence of moving from a low-frequency, batch-consolidation reporting model to one that operates continuously. Organisations planning a similar transition should factor this resourcing requirement into their implementation planning. The investment in data entry discipline is what makes real-time visibility real.

Structural Outcomes

The deployment delivered the following structural changes to Nayara's STO management capability:

- A single source of data for all STO planning, execution, and reporting data — eliminating the parallel Excel and P6 information environments that previously coexisted.
- Unified execution visibility for the first time — P6 job progress and STO Manager's planning, budget, and manpower data brought together in a single real-time view, eliminating the need for manual data extraction and consolidation.
- Real-time leadership visibility through the Procify STO Manager dashboard suite, replacing a manual reporting process with live data.
- A scalable Gantt-based planning environment capable of managing 16,000+ activities.
- A maintainable integration architecture on Procify that will support future STO cycles without requiring rebuilding or significant re-engineering.

“

Your commitment to continuously enhancing the Procify STO Manager software and your ability to resolve critical issues swiftly during the Turnaround were truly commendable. The responsiveness and support you provided throughout the event helped ensure smooth execution of key turnaround activities. Your contributions played a significant role in the overall success of the Turnaround and left a lasting positive impact on the team.

Sathyanarayana Singh — VP & Head IT (Refinery, Marketing and Corporate), Nayara Energy Limited

ADDITIONAL NAYARA PERSPECTIVE ON OUTCOMES

The deployment delivered significant intangible benefits. Centralised data storage eliminated the confusion of multiple, scattered sources, ensuring that all stakeholders worked from a single, authoritative version of data. The availability of Management Information System (MIS) reports and data reconciliation tools further enhanced transparency and instilled greater trust in the process.

The introduction of the Shutdown Readiness Score (SRS) and Execution dashboards provided actionable insights into turnaround progress, fostering a culture of data-driven decision-making across the organisation.

Recommendations for STO Modernisation

Based on the Nayara Energy experience and Maventic's broader work in asset-intensive industries, we offer the following recommendations for refinery and plant leadership considering a similar transformation.

01 Audit Your Planning Fragmentation Before Selecting Tools

Most STO technology decisions are made in response to a specific pain point — usually the pain of manual reporting or the inadequacy of Excel at scale. A more durable approach is to first map all data flows in your current STO process: where data originates, where it is transformed, and where it is consumed. The gaps between these steps are where your greatest inefficiencies live. This audit typically takes two to four weeks and provides the architecture brief for any subsequent technology deployment.

02 Treat P6–SAP Integration as a Strategic Priority, Not a Technical Afterthought

The integration between your scheduling system and your ERP is not a nice-to-have. It is the foundational data pipeline that determines whether your materials team, finance team, and operations leadership are working from the same reality. Organisations that defer this integration — planning to add it "later" — invariably find that "later" never comes, and the manual workarounds become institutionalised. Build integration into the scope of any STO technology programme from day one.

03 Choose a Platform That Can Handle Your Data Volume

A Gantt chart managing 500 work orders performs very differently from one managing 16,000. Many organisations discover, too late, that their selected planning application does not scale to their STO complexity. Before any procurement decision, insist on a performance test using your actual data volumes — both the number of line items and the complexity of interdependencies. A system that performs well in a demo environment but degrades under real-world data is a common and costly failure mode.

04

Define Your Reporting Requirements Before You Configure Your Dashboards

The dashboards your leadership team needs during a live turnaround are different from the dashboards your planners need three months before execution. Both are different from what your procurement team needs at the peak of material delivery. Before configuring any reporting layer, map the reporting matrix: who needs what, at what frequency, and what decision it informs. This exercise typically reveals that organisations need fewer dashboards than they think, but that those dashboards need to be more accurate.

05

Plan for the Next Cycle, Not Just the Current One

The most sophisticated STO management organisations use each cycle to build the data foundation for the next. Every work order completed, every material consumption record, and every contractor performance metric is an input to the scoping and planning process for the subsequent turnaround. A platform that captures and retains this data across cycles provides compounding value — the fourth cycle benefits from three cycles of historical intelligence. Select tools with this multi-cycle data strategy in mind.

CONCLUSION

The Path Forward

The fragmentation of STO planning is not an inevitable feature of refinery operations. It is a legacy of tools that were not designed to work together, processes that grew around those tools, and an industry that has been slow to apply to turnaround management the same digital rigour it applies to throughput optimisation.

Nayara Energy's deployment of Procify STO Manager, integrated with SAP via Procify, demonstrates that this fragmentation can be resolved — not through a multi-year transformation programme, but through a focused 36-month engagement that delivers a connected planning architecture capable of managing the full complexity of a 20 MMTPA refinery's turnaround cycle.

The maturity framework presented in this paper offers a practical lens for any organisation evaluating where it stands and what it would take to move forward. The move from Stage 2 to Stage 3 — from structured but fragmented to genuinely integrated — is achievable, measurable, and financially justified by the elimination of reconciliation overhead alone, before the benefits of real-time visibility are counted.

The question for plant leadership is not whether to modernise STO management. The question is how many more turnaround cycles to run on Excel before making the investment.

About the Authors

About Nayara Energy

Nayara Energy Limited is one of India's largest and most sophisticated private sector refining companies. Operating the Vadinar refinery in Jamnagar district, Gujarat — with a capacity of 20 million metric tonnes per annum — Nayara is a significant contributor to India's energy security. The company operates an extensive retail network and is committed to progressive digitalisation of its refining and downstream operations. nayaraenergy.com

About Maventic Innovative Solutions

Maventic is an enterprise IT and SaaS company headquartered in Bengaluru with operations across India, GCC, and Southeast Asia. We specialise in SAP implementations, proprietary SaaS products, and integration services for asset-intensive industries including Oil & Gas, Manufacturing, Energy, and FMCG. Our product portfolio includes Procify STO Manager, Procify Maintenance Planning Board, and Procify Mobile Asset Maintenance, powered by Procify — our AI-enabled low-code platform. maventic.com

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