



RESULTS AT A GLANCE

\$9.7 MILLION

Annual pretax earnings
improvements (12%)

20 to 75%

Increase in Preventative
Maintenance Work Orders

**27 Bad Actors
Solved**

New Program and Cadence
in place

**9 Equipment
Improvement
Teams**

To bring Equipment Back
to OEM Standards

**RCM Strategy at 8
Plants**

Reliability Centered
Maintenance Implemented
at 8 Plants

60 to 15%

Decrease in Emergency
Work Orders (P1)

Implementing a New Reliability and Maintenance Strategy across multiple Global Chemical Plants to improve Asset Availability and Maintenance Productivity

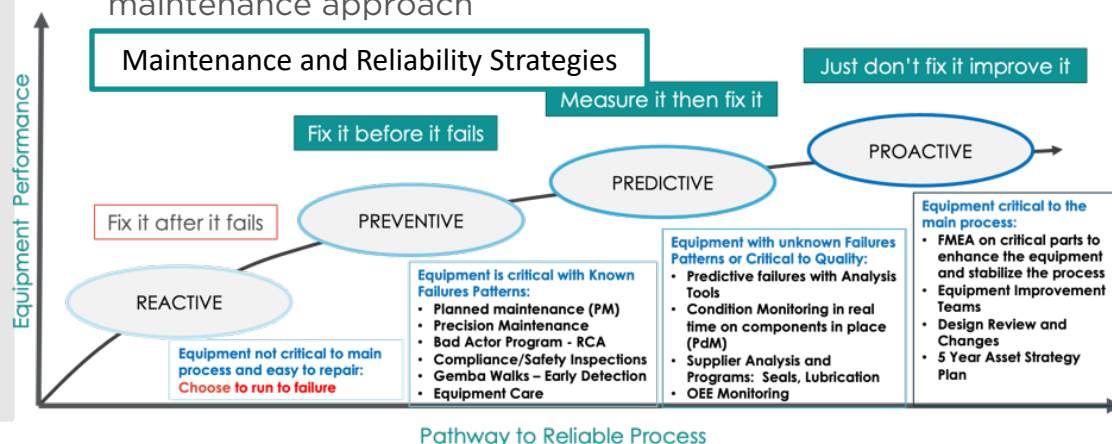


The Situation

- The company was in a highly reactive mode and experiencing significant production losses due to asset availability
- Management recognized the need to build a comprehensive standardized Reliability Program across all sites
- A major objective was to identify quick hits to stabilize operations
- Maintenance efficiency; minimizing rework, improving time on tools, and right-sizing contractors was a foundational element of the program

Argo's Solution & Approach

- Argo developed a maintenance and reliability strategy and execution program to drive root cause problem solving, equipment improvement teams and a reliability centered maintenance approach

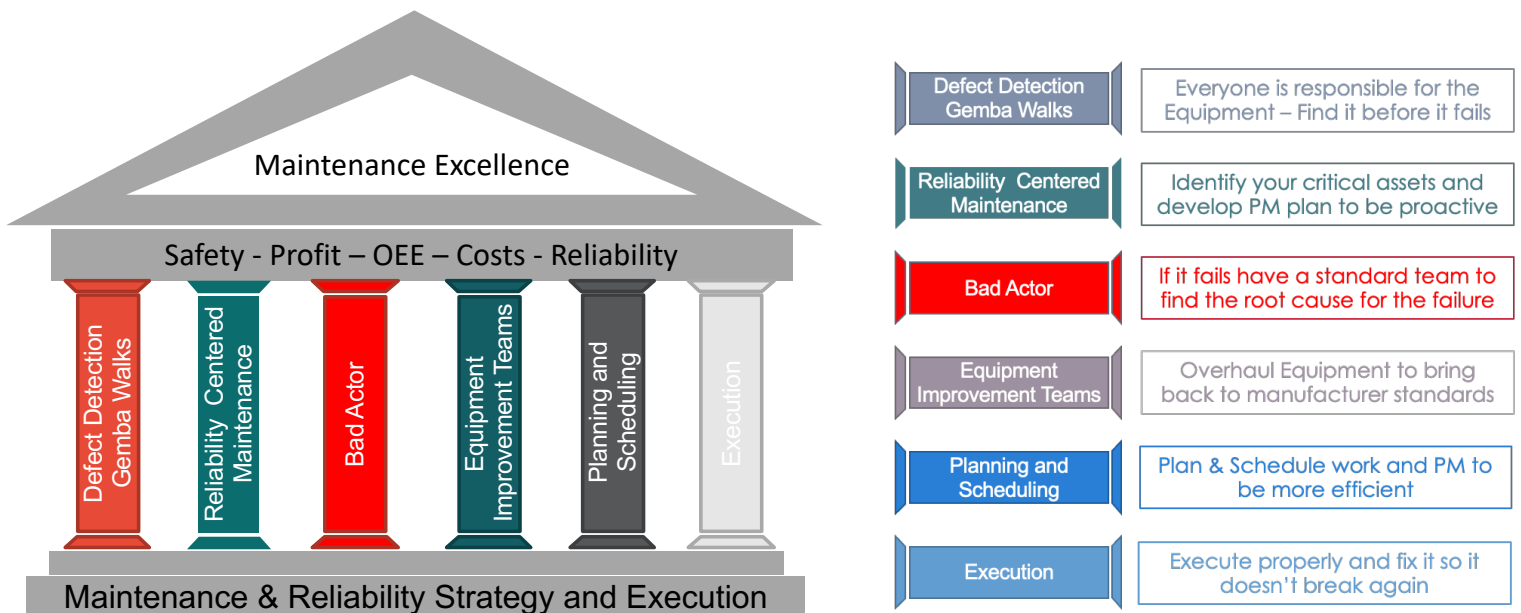


Argo used its proprietary Best Run Chemical Operations Playbook to drive maintenance productivity and reliability performance improvement:

- Instituted a joint team of operations and maintenance to own and drive the overall reliability of the equipment
- Implemented leader walks for early detection of failures
- Implemented Reliability Centered Maintenance Strategies
- Developed Equipment Criticality Programs
- Created Bad Actor Root Cause Problem Solving Program
- Stood up Equipment Improvement Teams
- Created Equipment Care Procedures
- Established and drove performance with KPI's
- Defined new roles & responsibilities
- Drove accountability & leadership
- Implemented new Planning and Scheduling Improvements
- Barrier Elimination Program to improve Productivity
- Developed Playbook Approach



GAIN CONTROL OF RELIABILITY



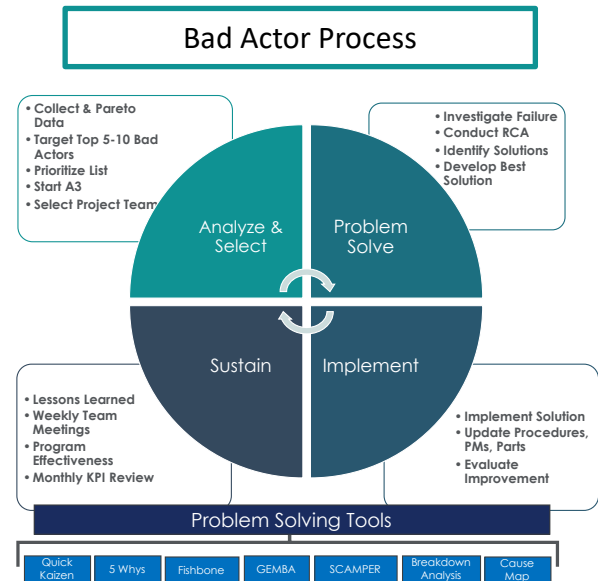
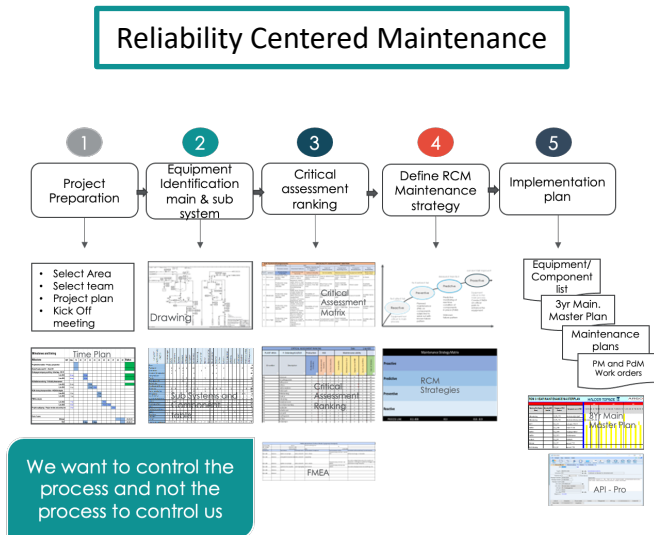
Argo's Actions

Argo worked with the client to create a culture of operations and maintenance collaborating on the stability of the equipment in cross functional teams .

Next, we defined and applied maintenance and reliability strategies by working with the teams to conduct critical asset assessments, reactive to proactive strategies, early detection of failures, problem solving tools, structure and cadence.

In order to sustain these strategies, we then created client organization and training and development programs for facilitators and support personnel. We defined and documented the methodology and roles and responsibilities for the new organization, creating playbooks for the organization.

Key Approaches:



Equipment Improvement Teams

Work ID to Execution

EQUIPMENT IMPROVEMENT TEAM PROCESS **ARGO CONSULTING**

EIT activities are typically carried out in a shift work environment, a practical form of communication between the shift and across the organization is the Story Board

1. Machine Function & Production Losses
2. Initial Cleaning, Inspection & Tagging
3. Problem Solving & Equipment Improvements
4. Equipment Care Standards & Training

For each step documents and outcome from the work shops is placed on a practical board easy to carry around for presentation

WORK ID TO EXECUTION PROCESS MAP **ARGO CONSULTING**

A large wall size process map of the enhances process has been developed as a training aid and a visual checklist for Operations and Maintenance Users

WORK ID. THROUGH EXECUTION FLOW

EQUIPMENT CARE
PRE-IDENTIFICATION

WORK IDENTIFICATION
NOTIFICATION

SCOPING AND PLANNING
JOB SCOPE

Summary:

- Defined the strategies to control the equipment rather than the equipment controlling the plan
- Embarked upon a program to change the culture to be reliability focused with both maintenance and operations
- Applied root cause problem solving to get at the root of the problem and prevent from recurring
- Planned, scheduled and executed the work in the most efficient way

Impact Dollars and Results

- \$9.7 million (12%) annual pretax earnings improvements
- Improved work order quality
- Increase in PMs 20 to 75%
- 27 Bad Actors Solved with New Program and Cadence
- Conducted 9 Equipment Improvement Teams bringing Equipment Back to OEM Standards
- Established RCM Strategy at 8 Plants
- Decrease in Emergency WO (P1) 60 to 15%
- Established KPIs

THE CONTINUOUS IMPROVEMENT CYCLE OF IMPROVING RELIABILITY

