



DISTRIBUTORS HELPING THEIR CLIENTS

**A ROADMAP TO DEVELOPING A
SAFETY & PREVENTATIVE MAINTENANCE
PROGRAM**

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Purpose

This Guide is intended to serve as a program planning roadmap for Distribution members to use in opening a discussion and promoting the creation and adoption of a comprehensive safety and preventative maintenance program with their end-users. This Guide can also be used by NAHAD member companies who feel they need a more comprehensive plan in place for their own shop.

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1.0 Importance of Developing a Plan

Reduce and mitigate the risk to personal, the environmental, ensuring regulatory compliance, and minimizing down-time by adopting industry best practices for solid/air/fluid conveyance. Having a plan, and following the plan will maximize through-put, increase capacity and productivity. Below is a list of considerations for building a comprehensive plan.

2.0 Making the Business Case for Developing a Plan

Prove the value of having a plan based on a **Safety Survey**

- Conduct a Risk Analysis/Asset Review for all hoses in use or storage. Examples include:
 - o Checking hose covers
 - o Missing couplings
 - o Couplings broken or damaged
 - o Noticeable leak paths
 - o Hoses storage: weight, temperature, excessive exposure to sunlight or UV rays
 - o Date code or assemblies past their use date (currently in use or in storage)
- Check for internal and/or federal and regulatory compliance.

3.0 Gain Buy-In to Develop and Implement a Company-Wide Plan

Develop the proposition for Value-Cost Return and mitigated risk. Words to include:

- o Employee safety
- o Down-time reduction
- o Fewer environmental hazards
- o Lower risk of hose failures and the impact due to collateral damage
- o Minimized liability and potential litigation

4.0 Who Should be Involved

Identify who's involved at different stages of plan development and implementation.

	Buy-In / Direction	Task Force	Feedback / Forums	Education / Training	Accountability
Executive Team	x				x
Safety Manager		x			x
Compliance Manager		x			x
Asset Manager		x			x
Purchasing Manager			x		x
Engineering Staff			x	x	x
Technical Staff			x	x	x
Maintenance Staff			x	x	x
Plant Manager		x		x	x
Shift Personnel			x	x	x

5.0 Components of a Comprehensive Plan

5.1 Mission & Vision Statement

- Is safety, in all forms, mentioned in the company's mission or vision statement?
- Is there Executive/Senior Level buy-in for development and maintenance of this plan?
- Is collaboration & employee involvement encouraged and supported in these company-wide projects?

5.2 Asset Management

- Inventory Control
 - o First in; first out
- Inventory Storage
 - o Hoses are clean, dry, out of direct weather, environmental storage
 - o Hoses stored do not exceed the minimum bend radius
 - o Hose staking; pallet weight
- Leveraging Technology
 - o Hose Tracking (barcodes, chips, labeling)
 - o EPA Required Codes (date, chemical transfer on layline)

5.3 Compliance with Applicable Standards and Regulations

- Regulations
 - o OSHA
 - o EPA
 - o USCG
 - o USDA, DOT
 - o 3A (Food & Beverage)
 - o UL
 - o ASME
- Standards
 - o ISO/AS 9100
 - o CN/EN
 - o SAE
- Best Practices
 - o NAHAD Hose Safety Institute
 - o Environmental (PFAS)
 - o REACH (Material Content)
 - o ESG

6.0 Asset Management & Maintenance

- Corrective Maintenance
 - o Determining cause of hose cover damage
 - o Determining cause of leaks

- Preventative Maintenance
 - o Visual inspections
 - o Annual hose testing
- Risk-based Maintenance
 - o Proper routing and installation procedures
 - o Hose protection accessories
- Condition-based Maintenance
 - o Time or use-based change-out based on the application and historical service life of the hose

7.0 Feedback & Communication

- Employee Involvement
 - o Focus Groups
 - o Information & Debrief Sessions
- Team Communications
 - o Newsletter/Email Messaging
 - o Lunch Sessions/Team Meetings
- Safety Task Force
 - o Meet periodically to review progress/adherence to the plan
- Plant/Site messaging – Safety First Campaign

8.0 Timeline

- Develop a timeline for each step in the plan
 - o Include specific start and end dates
 - o Identify benchmarks to ensure the project proceeds as planned
 - o Consistently check-in with project leads to monitor progress
 - o Build in flexibility for unexpected setbacks or delays
- Always maintain forward progress

9.0 Implementation, Education, & Training

- Understanding Hose and Equipment safety
 - o Employees buy-in
 - o Employee accountability
- Onsite, Hands-On training
 - o Technicians/Operators
 - o Shift Personnel

- Safety Inspections
 - Equipment handling
 - Hose Routing, Care & Maintenance
 - Hose out of harm's way (drive-overs; hanging...)
 - Required Shift Inspections
 - Lockout/Tagout Practices
 - PPE (present; correctly used)

10.0 Accountability to a Building & Sustaining a Safety Culture

- Upper Management
- Supervisory
- Shift Personnel

APPENDIX A. DEFINING DIFFERENT LEVELS OF MAINTENANCE

Maintenance.

- **Corrective Maintenance**

Maintenance is carried out following detection of an anomaly and aimed at restoring normal operating conditions. This approach is based on the firm belief that the costs sustained for downtime and repair in case of fault are lower than the investment required for a maintenance program. This strategy may be cost-effective until catastrophic faults occur.

- **Preventative Maintenance**

Maintenance carried out at predetermined intervals or according to prescribed criteria, aimed at reducing the failure risk or performance degradation of the equipment. The maintenance cycles are planned according to the need to take the device out of service. The incidence of operating faults is reduced.

- **Risk-based Analysis**

Maintenance carried out by integrating analysis, measurement, and periodic test activities to standard preventive maintenance.

The gathered information is viewed in the context of the environmental, operation and process condition of the equipment in the system. The aim is to perform the asset condition and risk assessment and define the appropriate maintenance program.

All equipment displaying abnormal values is refurbished or replaced. In this way it is possible to extend the useful life and guarantee over time high levels of reliability, safety, and efficiency of the plant.

- **Condition-based Maintenance**

Maintenance based on the equipment performance monitoring and the control of the corrective actions taken as a result.

The real actual equipment condition is continuously assessed by the on-line detection of significant working device parameters and their automatic comparison with average values and performance. Maintenance is carried out when certain indicators give the signaling that the equipment is deteriorating, and the failure probability is increasing.

This strategy, in the long term, allows reducing drastically the costs associated with maintenance, thereby minimizing the occurrence of serious faults and optimizing the available economic resources management.

Resource: ABB Connect [Link](#)