# SNS COLLEGE OF TECHNOLOGY

Coimbatore–35
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## DEPARTMENT OF MECHANICAL ENGINEERING
## 19MEB204 IoT FOR PRODUCTION SYSTEM

## TOPIC – Advanced Automated Functions

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# Advanced Automated Functions

In addition to executing work cycle programs, an automated system may be capable of executing advanced functions that are not specific to a particular work unit. In general these functions are concerned with enhancing the performance and safety of the equipment.

Advanced automation functions include the following:
- Safety monitoring
- Maintenance and repair diagnostics and
- Error detection and recovery

## Functions of safety monitoring

- To protect human workers in the vicinity of the system and

- To protect the equipment associated with system.

Possible responses to various hazards might include one or more of the following:

- Complete stoppage of the automated system.
- Sounding an alarm
- Reducing the operation speed of the process
- Taking corrective actions to recover from the safety violation

The following list suggests some of the possible sensors and their application for the safety monitoring:

- Limit switches.
- Photoelectric sensors
- Temperature sensors
- Heat or smoke detectors
- Pressure sensitive floor pads

## Maintenance and Repair Diagnostics

Maintenance and Repair Diagnostics refers to the capabilities of an automated system to assist in the identification of the source of potential or actual malfunctions and failures of the system. Three modes of the operation are typical of a modern maintenance and repair diagnostics subsystems:

- Status monitoring
- Failure diagnostics
- Recommendation of repair procedure

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## Maintenance and Repair Diagnostics

▶ *Status monitoring*

 ▶ Monitors and records status of key sensors and parameters during system operation

▶ *Failure diagnostics*

 ▶ Invoked when a malfunction occurs

 ▶ Purpose: analyze recorded values so the cause of the malfunction can be identified

▶ *Recommendation of repair procedure*

 ▶ Provides recommended procedure for the repair crew to effect repairs

## Maintenance and Repair Diagnostics

They have three modes of operation:

1. Status monitoring: current system parameters.

2. Failure diagnostics: detects malfunctions and identifies the causes of the failure.

3. Recommendation of repair procedure: using artificial intelligence to suggest repair steps

# Advanced Automated Functions

## Status monitoring

Status monitoring serves two important functions in machine diagnostics:

- Providing information for diagnosing a current failure and
- Providing data to predict a future malfunction or failure

## Error Detection and Recovery

Error Detection: As indicated by the term, error detection and recovery consists of two steps:

- Error detection and
- Error recovery.

In analyzing a given production operation, the possible errors can be classified into one of three general categories

- Random errors
- Systematic errors and
- Aberrations

## Error Recovery

Error recovery is concerned with applying necessary corrective action to overcome the error and bring the system back to normal operation.

1. Make adjustments at the end of current cycle
2. Make adjustments during the current cycle
3. Stop the process to invoke corrective action
4. Stop the process and call for help

# THANKS!