



Reliability Information Management

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BEST PRACTICES

RIM Program

- Single Database
- Actionable Info
- Program Value
- Basic Reliability Metrics

Asset Health

- Condition Based Inspections
- Integrated Dashboard
- Basic Care
- Asset Health Metrics

Work Management

- Reds Meetings
- RCFA Corrective Actions
- Work Management Metrics

Life Optimization

- Repair Vendor Interface
- Failure Analysis
- Bad Actor List
- Equipment Metrics

Current State of Reliability Management

Many separate pieces of reliability information in reports, databases, computer folders, spreadsheets

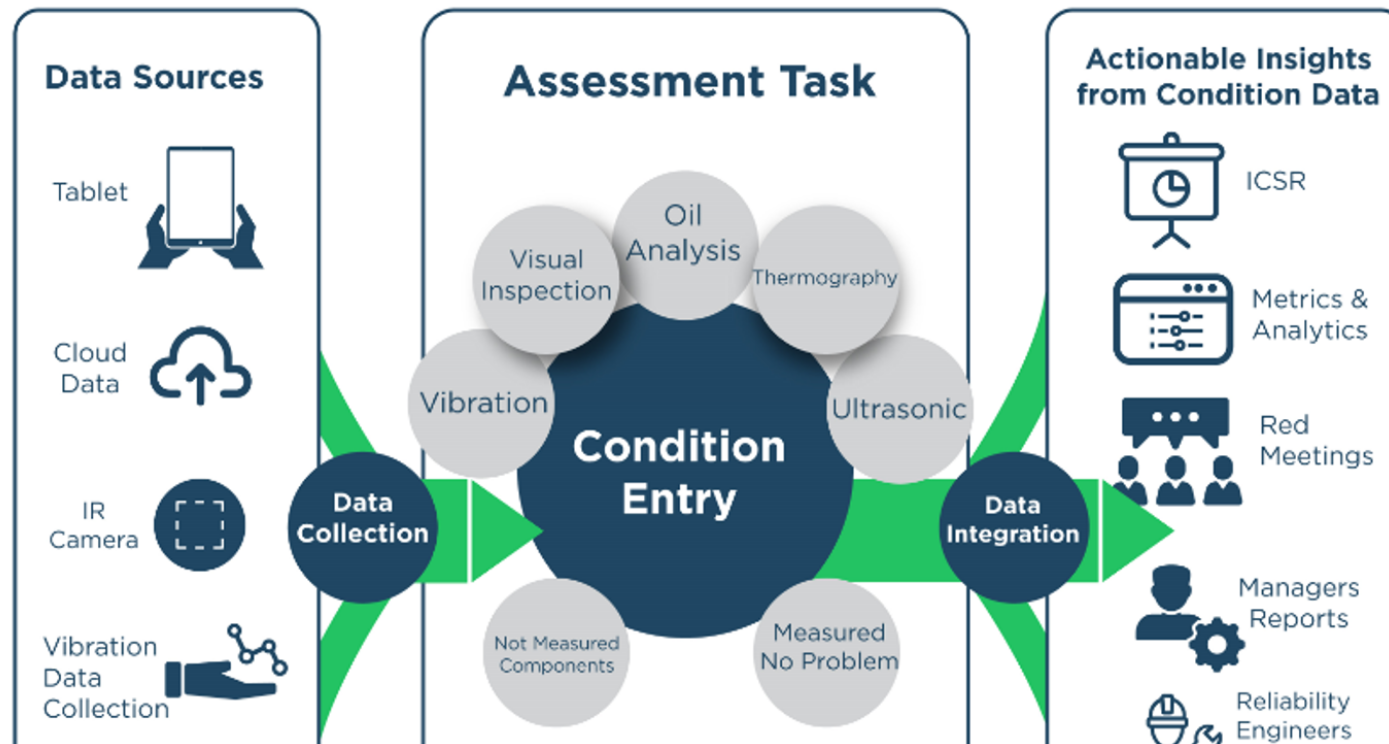
No Standardization

No Integration

Poor Communication

Poor Accountability

No Ability to Analyze Performance



Best Practice #4

Manage Condition Monitoring Tasks Efficiently

- Assessments document inspection results
- ICSR reports & resolves component condition problems

Documenting Inspections

- **ISO 55000** Asset Management Standard requires documented monitoring plans and auditable documentation of compliance to those plans

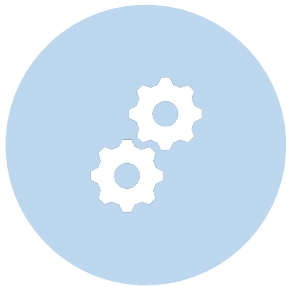
Condition Assessment Task



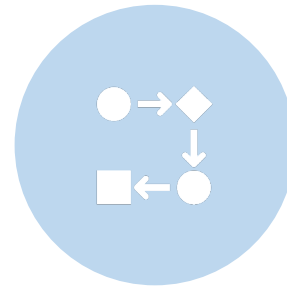
Condition assessment tasks specify the assets required to be monitored by technology and interval



An assessment task will list specific components to be inspected

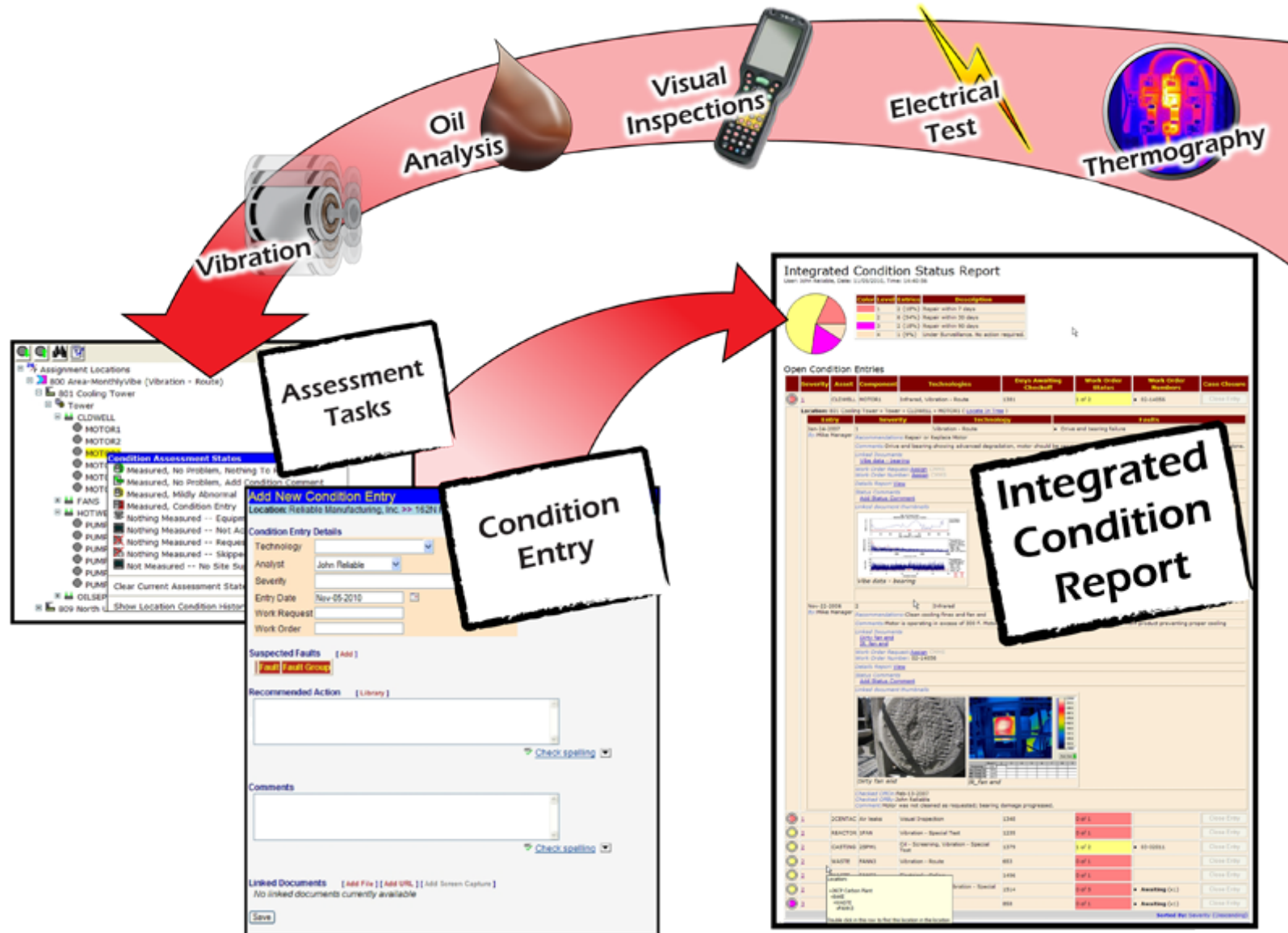


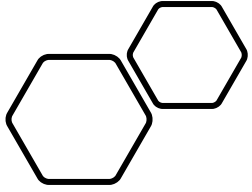
Components are assets like MCC Buckets, Electrical Panels, Gearboxes, Motors, etc.



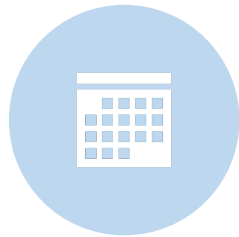
Route Order defines the sequence of inspection when a task is performed on a mobile device

Condition Task Process Flow

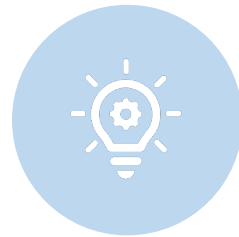




Standardize Condition Task Process in the Master Reliability Database



CREATE TASK DEFINITION &
SCHEDULE FOR WORK TO BE
PERFORMED



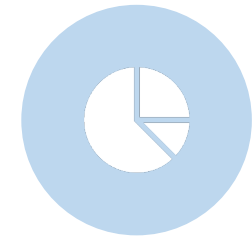
PROVIDE ROUTING FOR
SYSTEMS THAT MAY NOT HAVE
NATIVE ROUTING, SUCH AS IR,
ULTRASOUND, MCE



NOTIFY BY EMAIL WHEN A
TASK IS DUE TO START



ENFORCE STANDARDIZED TASK
RESULTS ENTRY



MAINTAIN A RECORD OF WHAT
WAS OR WAS NOT MEASURED
AND WHAT WAS FOUND

Task Definition

- Documents expectations for each condition monitoring activity
- Sets the expected schedule for task work
- Assigns accountability to a person

Condition Assessment Task Control Panel

Open Assignments Create

Showing Active Tasks

	Task Name	Techn	Is Active	Mobile	Task C
	101 Cooling Tower-MonthlyVibe	Vibrat Route	<input checked="" type="checkbox"/>		
	104 80" Mill-Semiannual IR	Infrar	<input checked="" type="checkbox"/>		
	104 Hotline - Crane 7120019	Vibrat Route	<input checked="" type="checkbox"/>		Crane
	162 CP &	Electri	<input checked="" type="checkbox"/>		

Edit Task Definition

Task Name: 104 Hotline - Crane 7120019

Technology: Vibration - Route

Next Due To Start Date: Jun 01, 2020

Interval: 30

Assigned User: John Reliable

Days To Complete: 7

Plant Notification Email: 104HotlineSupervisor@plant.com

Task Group Name: CraneInspections

Task Locations

- Defines which component locations to monitor
- Location hierarchy should match the work order system nomenclature

Task Location Selection

Task Name: 104 Hotline - Crane 7120019 Technology: Vibration - Route

All Selected

Save

Selected <input type="checkbox"/>	Unit <input type="text"/>	Function <input type="text"/>	Asset <input type="text"/>	Component <input type="text"/>	Equipment Type <input type="text"/>	Equipment Class <input type="text"/>
<input checked="" type="checkbox"/>	104 Hotline	Cranes	7120019	AUX H	Motor - AC Induction	Motors
<input checked="" type="checkbox"/>	104 Hotline	Cranes	7120019	HOIST	Motor - AC Induction	Motors
<input checked="" type="checkbox"/>	104 Hotline	Cranes	7120019	NBRIDGE	Motor - AC Induction	Motors
<input checked="" type="checkbox"/>	104 Hotline	Cranes	7120019	SBRIDGE	Motor - AC Induction	Motors
<input checked="" type="checkbox"/>	104 Hotline	Cranes	7120019	TROLLEY	Motor - AC Induction	Motors
<input checked="" type="checkbox"/>	104 Hotline	Cranes	7120290	HOIST	Motor - AC Induction	Motors
<input checked="" type="checkbox"/>	104 Hotline	Cranes	7120290	NBRDG	Motor - AC Induction	Motors
<input checked="" type="checkbox"/>	104 Hotline	Cranes	7120290	SBRDG	Motor - AC Induction	Motors
<input checked="" type="checkbox"/>	104 Hotline	Cranes	7120290	TROLL	Motor - AC Induction	Motors

Task Routing on Mobile Devices

- Create monitoring sequence for systems without native routing capability
- For example, some IR Thermography, Ultrasonics, & Electrical Testing

Condition Assessment

Open Assignments Create

Showing Active Tasks

Task Name	Technology
101 Cooling Tower- MonthlyVibe	Vibrat Route
104 80" Mill- Semiannual IR	Infrare
104 Hotline - Crane 7120019	Vibrat Route

Task Name: 104 80" Mill- Semiannual IR

Technology: Infrared

Next Due To Start Date: Jun 22, 2020

Interval: 180

Assigned User: John Tech

Days To Complete: 15

Plant Notification Email: 10480MillSupervisor@plant.com

Task Group Name: IRThermInspections

Is Active

Setup for Hand-Held

Plant Configuration

Is Active	Mobile	Task Gr
<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/>		IRTherm
<input checked="" type="checkbox"/>		Cranel

Task Notifications

- Automate reminders that task work is due to start soon
- Notify both monitoring techs & plant contacts

Task Name: 104 80" Mill- Semiannual IR

Technology: Infrared

Next Due To Start Date: Jun 22, 2020

Interval: 180

Assigned User: John Tech

Days To Complete: 15

Plant Notification Email: 10480MillSupervisor@plant.com

Task Group Name: IRThermInspections

Is Active:

Setup for Hand-Held:

Condition Assessment

Open Assignments

Showing Active Tasks

	Task Name	Techn
⚡	101 Cooling Tower- MonthlyVibe	Vibrat Route
⚡	104 80" Mill- Semiannual IR	Infranc
⚡	104 Hotline - Crane 7120019	Vibrat Route

Plant Configuration

	Is Active	Mobile	Task Gr
	<input checked="" type="checkbox"/>		
ant.com	<input checked="" type="checkbox"/>	📱	IRTherm
plant.com	<input checked="" type="checkbox"/>		Cranel

Task Assessment

- Enforce standardized monitoring results entry
- 'KISS' method for no problems found or couldn't measure for some reason
- Efficient way to document any problems found

		Unit	Function	Asset	Component	Status	Previous Status
1	<input type="checkbox"/>	162 Carbon Plant	BAKE	WASTE		<input type="checkbox"/> No Condition	Nothing Measured -- Equipment
2	<input type="checkbox"/>	162 Carbon Plant	BAKE	WASTE			Nothing Measured -- Equipment
3	<input type="checkbox"/>	162 Carbon Plant	BAKE	WASTE			Nothing Measured -- Equipment
4	<input type="checkbox"/>	162 Carbon Plant	BAKE	WASTE			Nothing Measured -- Equipment
5	<input type="checkbox"/>	162 Carbon Plant	BAKE	WASTE			Measured, No Problem, Nothing
6	<input type="checkbox"/>	162 Carbon Plant	BAKE	WASTE	FANS2	<input type="checkbox"/> No Condition Assessment	Measured, Condition Entry Apr 01, 2005

Assessment Options

Measured -- Condition Entry

Measured -- Mildly Abnormal

Measured -- No Problem, Add Condition Comment

Measured -- No Problem, Nothing To Report

Nothing Measured -- Equipment Down for Repair

Nothing Measured -- Equipment Not Operating

Nothing Measured -- Equipment Unloaded

Nothing Measured -- Not Accessible

Nothing Measured -- Requested To Skip

Clear Current Assessment State(s)

Task Problem Reporting

- Enforce standardized problem severity & fault choices between different technologies & technicians
- Allow comments, recommendations, & linked documents to explain problem details

Condition Assessment // Technology Condition Entry Editor Cancel

162 CP & Fluidizing- Semiannual MCE *Electrical - Online*

Location 162 Carbon Plant » BAKE » WASTE » FANN1

Condition Entry Details

Technology	Electrical - Online ▼
Analyst	John Reliable ▼
Severity	2 {Repair within 30 days} ▼
Entry Date	
Work Request	4 {Under Surveillance. No action required.}
	3 {Repair within 90 days}
Work Order	2 {Repair within 30 days}
	1 {Repair within 7 days}
	E {Repair within 24 hours}

Task Linkage to Integrated Status Report

- Condition entries reporting problems should immediately be integrated with other condition problems on a browser-based dashboard
- Interactive single click access should allow users to open report details
- New condition entries should trigger email notifications, whether it's the first time the problem is reported or continuation of an existing case

Integrated Condition Status Report

User: John Reliable, Date: May 26, 2020, Time: 13:03:48

			Severity	Criticality	Unit	Function	Asset	Component	Technology	Most Recent Severity	Days Awaiting Checkoff
1			1	0	104 Hotline	Cranes	7120019	NBRIDGE	• Visual Inspection	1	94
2			1	0	162 Carbon Plant	BAKE	WASTE	FANS2	• Electrical - Online	1	5
3			1	0	101 Cooling Tower	Tower	CLDWELL	MOTOR1	• Infrared • Vibration - Route	1	53
4			2	0	162 Carbon Plant	BAKE	WASTE	FANN1	• Electrical - Online	2	0
5			2	0	170 Compressor	AIR	2CENTAC	Air leaks	• Visual Inspection	2	51
6			2	0	170 Compressor Room	AIR	2CENTAC	Compressor	• Oil Analysis - Screening	2	75

Task Adherence Management

- The Master Reliability Database can retrieve performance metrics for tasks from all condition monitoring technologies
- Reliability Managers can see where task scheduling or execution may need to be improved

Condition Assessment Task Metrics

⚡ Assignments closed between 6/26/2019 1:31:41 PM and 5/26/2020 1:31:41 PM

Task	Technology	Assignments	Items Per Task	Total Items ▼	Problems	Normal	Assessed Not Measured	Not Measured	% Route Adherence
VIB-MLCTP-RET ACTIVATED SLUDGE-MONTHLY	Vibration - Route	10	36	350	1	301	48	0	86.29
VIB-MLCTP-SLUDGE DEWATERING-QUARTERLY	Vibration - Route	3	96	259	3	186	70	0	72.97
IR MECH-MLCTP-INCINERATION-IFB-QUARTERLY	Thermography	3	54	162	1	121	40	0	75.31
UE-MLCTP-RETURN SLUDGE PUMPING-QUARTERLY	Ultrasonic Testing	3	42	122	7	112	3	0	97.54
IR ELEC-MLCTP-GRIT PROCESS-QUARTERLY	Thermography	3	38	114	0	114	0	0	100
VIB-TCTP-MONTHLY MONITORING-MONTHLY	Vibration - Route	9	6	54	0	36	18	0	66.67
VIB-MLCTP-SEC SETTLING-QUARTERLY	Vibration - Route	3	18	54	1	53	0	0	100