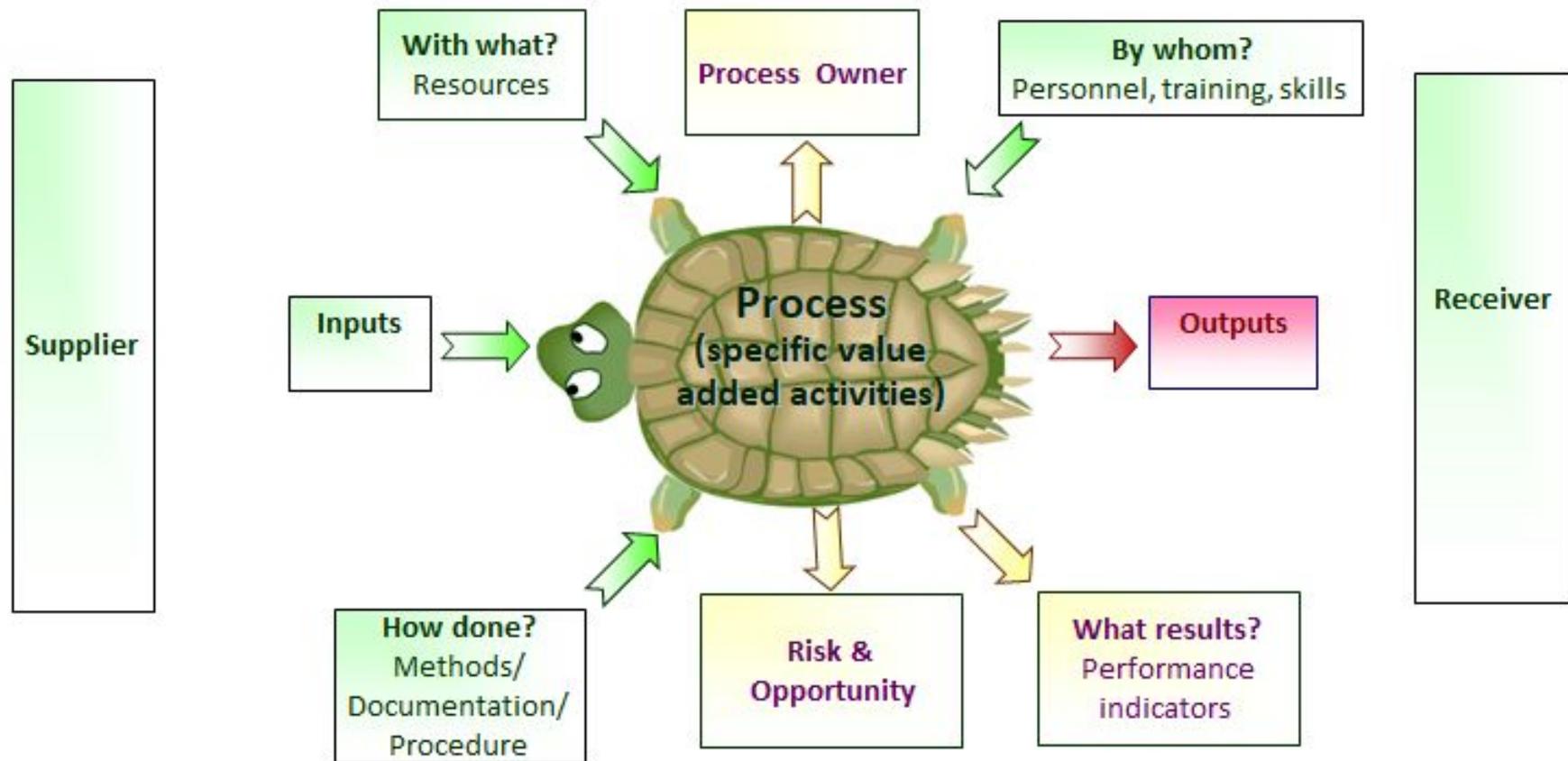




# MANAGEMENT CERTIFICATIONS

*SHASHWAT GUPTA*  
*Professor (WMT)*  
*IRIMEE*

# “Turtle Diagram”



# CERTIFICATIONS IN INDIAN RAILWAYS

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- ❑ Green Certification (CII) – Environmental performance
- ❑ ISO 14001 : 2015 – EMS/IMS certification
- ❑ ISO 50001 : 2018 – Energy Management System
- ❑ OHSAS 18001 : 2007  
(now ISO 45001 : 2018) – Occupational Health & Safety
- ❑ ISO 3834 : 2005 – Weld Quality Certification



# **GREEN CERTIFICATION (GREENCO)**

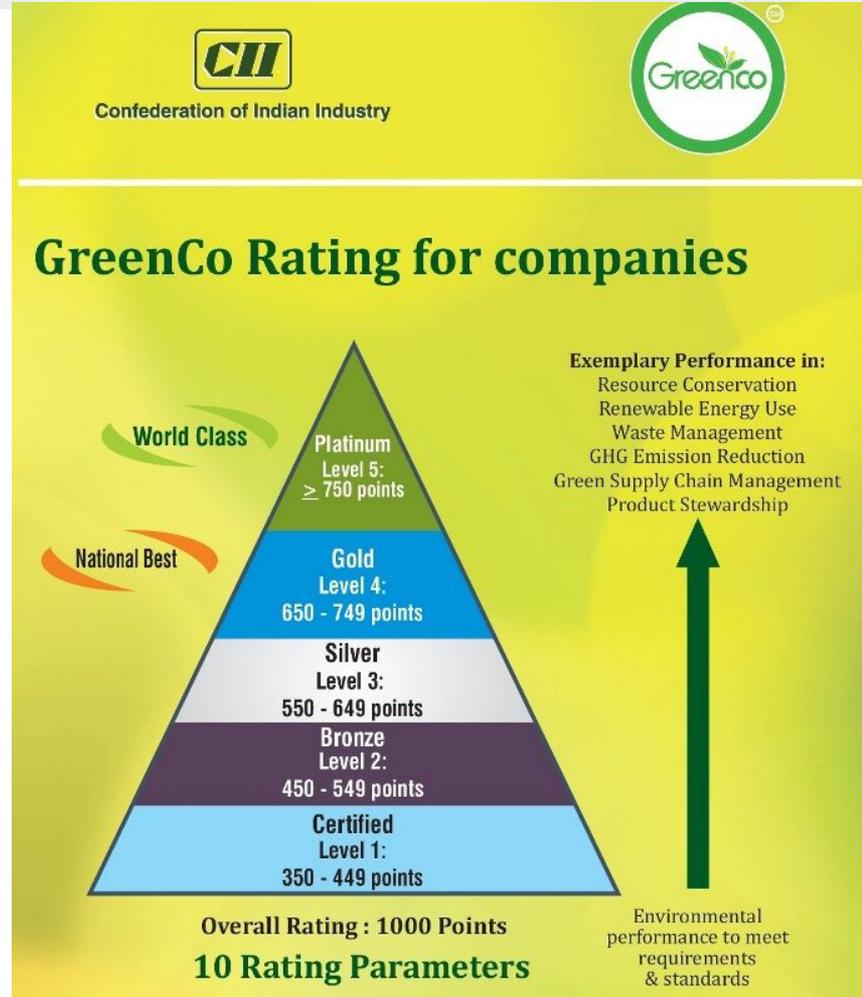
# GREEN CERTIFICATION

- ❖ By Memorandum of Understanding (MoU) between Railways and *Confederation of Indian Industry (CII)* in July 2016 to facilitate Green initiatives on Railways
- ❖ Green certification assesses *several environmental parameters*
- ❖ *Indian Green Building Council (IGBC)* along with RB's Environment Directorate developed Green Rly Stations Rating

✓ 39 Workshops, 7 PUs, 8 Loco Sheds and one Stores depot, 19 Railway stations and 27 other establishment buildings are Green certified

# GREEN CERTIFICATION

- ❑ Energy Efficiency (EE)
- ❑ Renewable Energy (RE)
- ❑ Greenhouse Gas (GHG)
- ❑ Water Conservation (WC)
- ❑ Waste Management (WM)
- ❑ Material Conservation,  
Recycling & Recyclability (MC)
- ❑ Green Supply Chain (GSC)
- ❑ Others (OS)



# GREEN CERTIFICATION

**World Class Energy Efficiency** – drives the company to become lowest Specific Energy Consumer within the sector.

**Water Neutral/Positive status** – provides road map for water conservation activities both within beyond the fence towards water neutrality or achieving water positive status

**Material Conservation & Recycling & Recyclability** – Drives Material efficiency on Raw materials, consumables, packaging materials, promotes reuse, recycling and recyclability of materials and increase the recyclability or biodegradability of their products

**Greener Supply Chain** – Promotes Green procurement, sustainable sourcing, Green logistics, Green packaging., Green vendor development

**Renewable Energy** – encourages companies to maximize the use of renewable energy through onsite generation or offsetting methods

**Green House Gas mitigation** – facilitates reduction of GHG emissions and gradually progresses towards carbon neutrality

**Product Stewardship** – drives companies to take up extended responsibilities such as Design for Environment, Toxicity Reduction, End of Life Management, & influence consumer behavior

**Life Cycle Assessment** – Encourages companies to conduct Environment Life cycle impact assessment (ELCA) and produce Environment Product Declarations.

**Zero Waste** – identifies ways & promotes Zero Waste to landfill, minimize effluents i.e. Zero liquid discharge and better gaseous waste management

**Green Building features, Biodiversity & Innovation** – Promotes Green buildings, Biodiversity & Green innovations

# GREEN BUILDINGS & RAILWAY STATIONS

- ❖ Green buildings *reduce or eliminate negative environmental* impacts while also creating a positive impact
- ❖ Green buildings promote healthier & more eco-friendly working
- ❖ Green building rating, training and certification is provided by the *Indian Green Building Council (IGBC)*, under the CII

✓ Many Railway buildings are IGBC certified, e.g. *Rail Nirman Nilayam Hyderabad - 1st*, & ICF GM office, RWF Administrative Building, DMW Administrative Building (all Platinum)

# GREEN RAILWAY STATIONS

- ❖ *CII-IGBC with the support of Environment Directorate* of Railway Board has developed the Green Railway Stations rating
- ❖ *Voluntary, consensus-based programme* to address environmental sustainability of Indian railway stations, reducing adverse environmental impacts, enhancing the commuter experience and providing manifold gains in reduced costs and increased efficiency

✓ *Notable green stations* are Jaipur, Visakhapatnam, New Delhi and Asansol (Platinum), CSMT (Gold), and Kevadiya-1st

# ADVANTAGES OF GREEN CERTIFICATION

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- ❖ Environment-friendliness
- ❖ Cost reduction
- ❖ Energy saving
- ❖ Technical assistance and training for new technologies, techniques & processes
- ❖ Drives innovation
- ❖ Image building



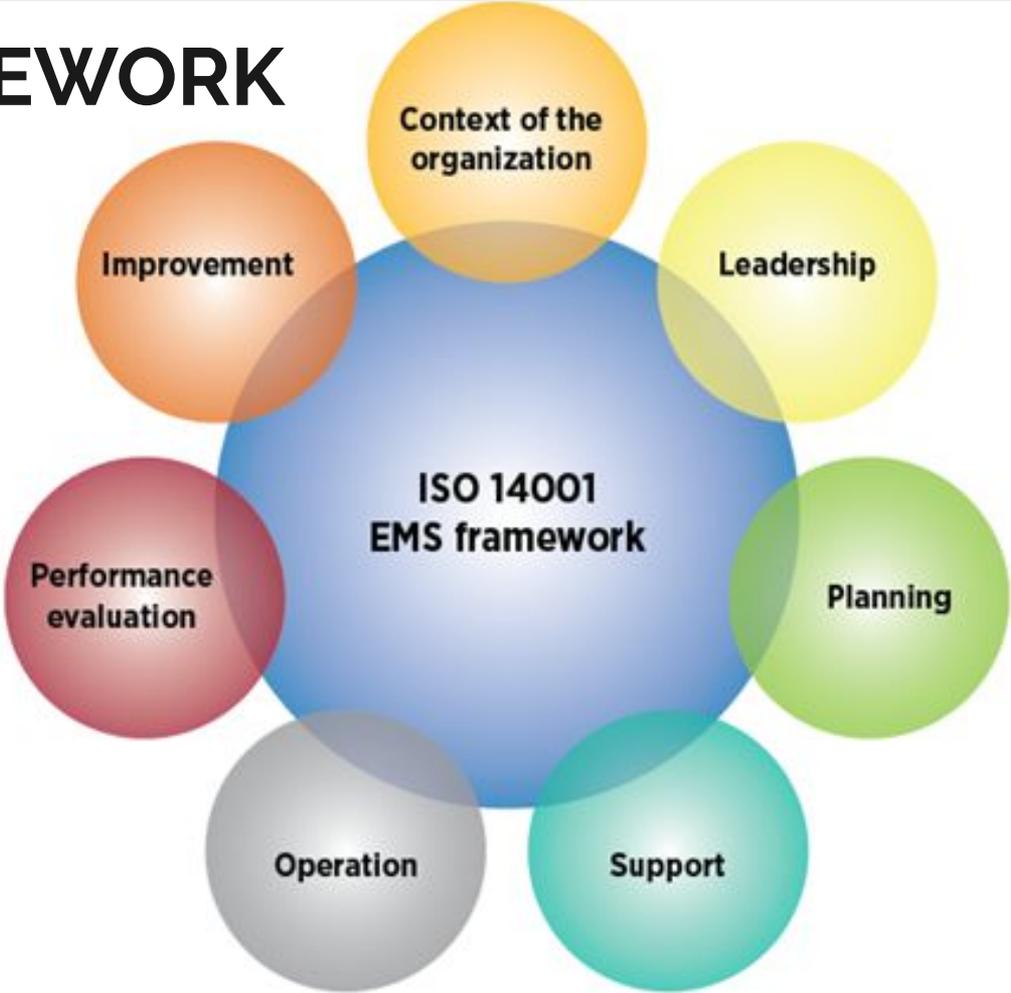
# ISO 14001 : 2015

# ISO 14001 : 2015

- ❖ ISO 14001 is an internationally recognized voluntary standard for an Environmental Management System (**EMS**) to holistically improve environmental performance, governed by **ISO/TC 207**
- ❖ It can be integrated with other ISO standards for greater efficiency and cost-savings, plus environmental sustainability,
- ❖ The newest version (2015) requires greater involvement of organizational leadership and tighter integration of environmental aims with the organization's strategic goals

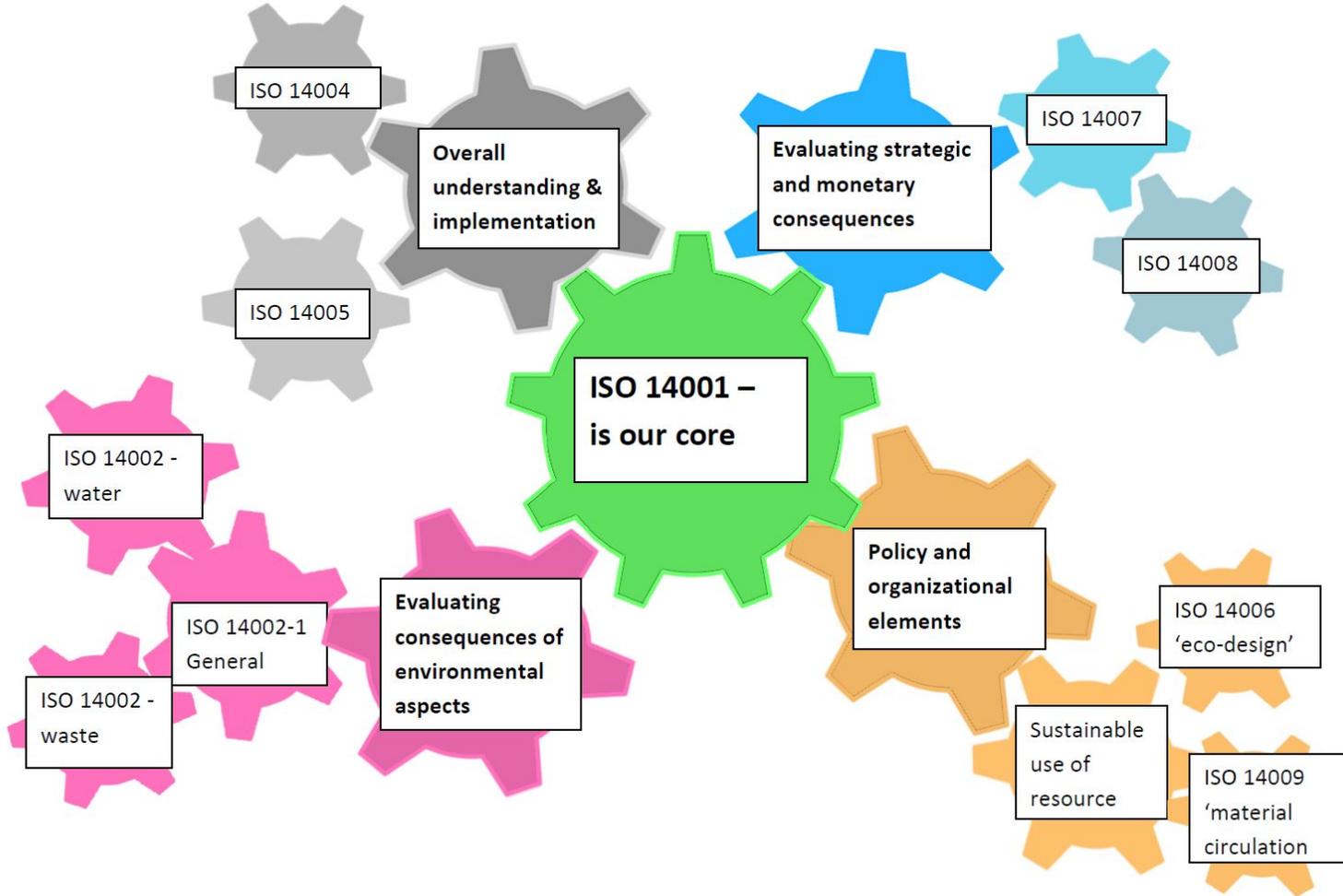
✓ All PUs, major Workshops, Diesel Sheds, Coaching & Freight Depots, MEMU/DEMU Sheds, railway stations (e.g. Secunderabad Jn., SCR)

# EMS FRAMEWORK

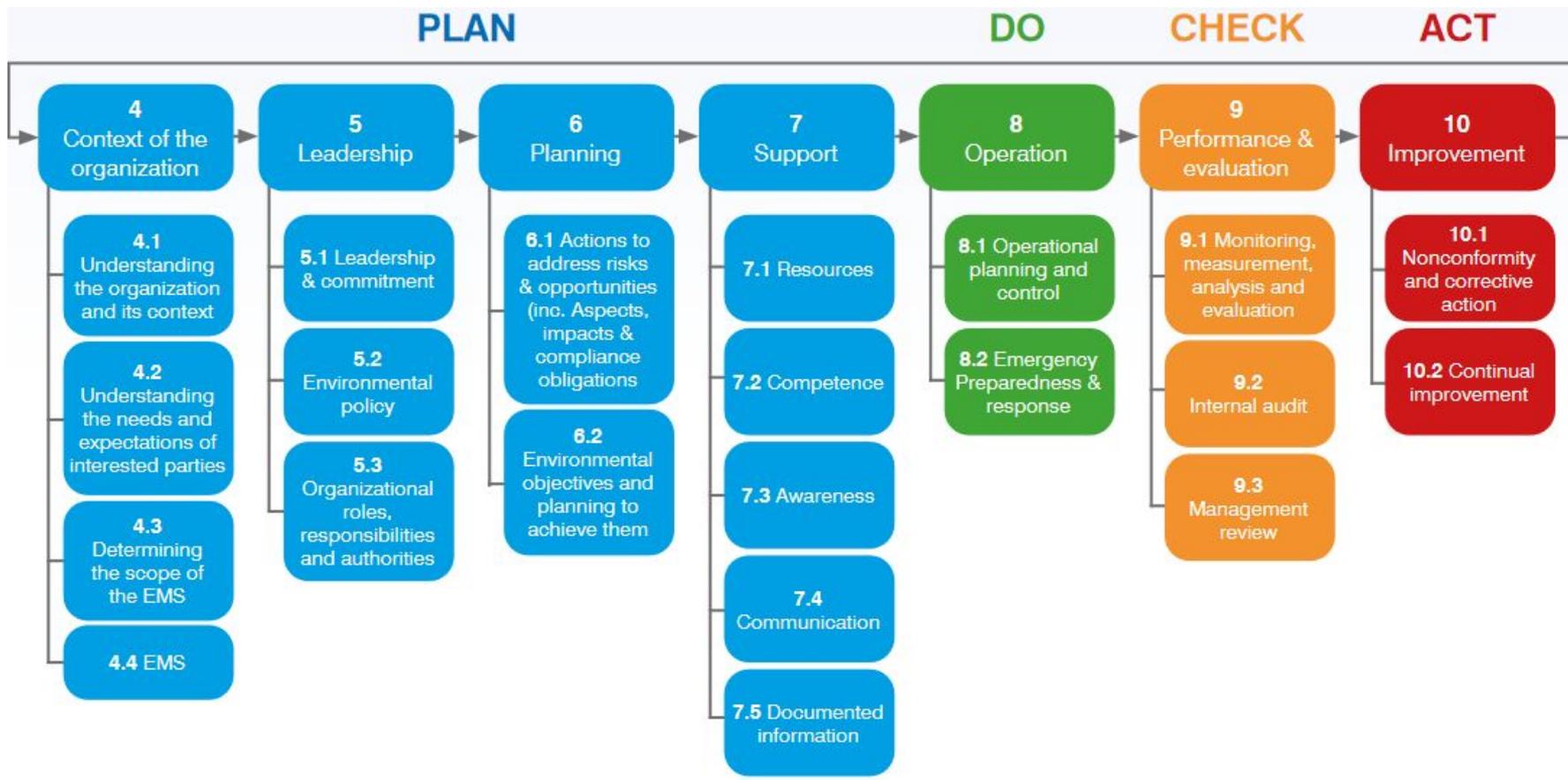


# TC/207 SC1

SC1 standard portfolio – 'plug into' SC1 core standard ISO 14001



# IMPLEMENTING ISO 14001: ANALYSIS & DOCUMENTATION



# ISO 14001 BENEFITS

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- ❖ A step ahead of existing statutory and regulatory requirements
- ❖ Certification process is an *employee-driven workflow*, so enhances collaborative engagement and leadership among the staff
- ❖ Achieve *strategic business aims* by incorporating environmental issues into business management
- ❖ Provides a *competitive financial advantage* by improved efficiency, reduced costs, higher stakeholder confidence and a better image
- ❖ Encourage better environmental performance of suppliers



# ISO 50001 : 2018

# ISO 50001 : 2018

- ❖ ISO 50001 is an international standard for Energy Management System (*EnMS*) to systematically improve energy performance, including usage, efficiency, security & conservation, and
- ❖ Requires demonstration of continual *energy performance* improvement (*ISO/TC 301*)
- ❖ Features a *data-driven approach* to energy management (rather than the multipronged qualitative approach of ISO 14001)

✓ Starting with ICF Chennai in August 2015, all 8 Production Units and 44 major Workshops are ISO 50001 certified

# ISO 50001 : 2018 IMPLEMENTATION

Like other ISOs, 50001 works on the *Plan-Do-Check-Act (PDCA)* model and provides a set of requirements for organizations to:

- ❑ Develop a *policy* for more efficient energy use patterns,
- ❑ Fix *targets* and objectives to meet that policy,
- ❑ Gather *data* to better understand and make decisions concerning energy use,
- ❑ Measure the *results* obtained,
- ❑ *Review* the *effectiveness* of the policy,
- ❑ Continually *improve* energy management

# ISO 50001 : 2018 IMPLEMENTATION



# ISO 50001 BENEFITS

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Improved energy performance, implemented in a standardized and scalable manner, carries many *benefits* for the organization, including:

- ❖ Lower costs,
- ❖ Better usage stats,
- ❖ Reduced environmental impact,
- ❖ Enhanced staff morale and
- ❖ Better public image



**ISO 45001 : 2018**  
**(formerly OHSAS 18001 : 2007)**

# ISO 45001 : 2018

- ❖ ISO 45001 is an ISO standard that specifies (*ISO/TC 283*) requirements for an Occupational Health & Safety (*OH&S*) management system to enable organizations to provide *safe and healthy workplaces*, prevent work-related injury and ill health, and
- ❖ Requires organizations to proactively *improve OH&S performance*,
- ❖ Based on *OHSAS 18001*, ILO-OSH guidelines, ILO international labour standards, various other national standards

✓ Major Railway units like PUs, Workshops, CTIs, etc are certified.

# ISO 45001 : 2018 – SALIENT FEATURES

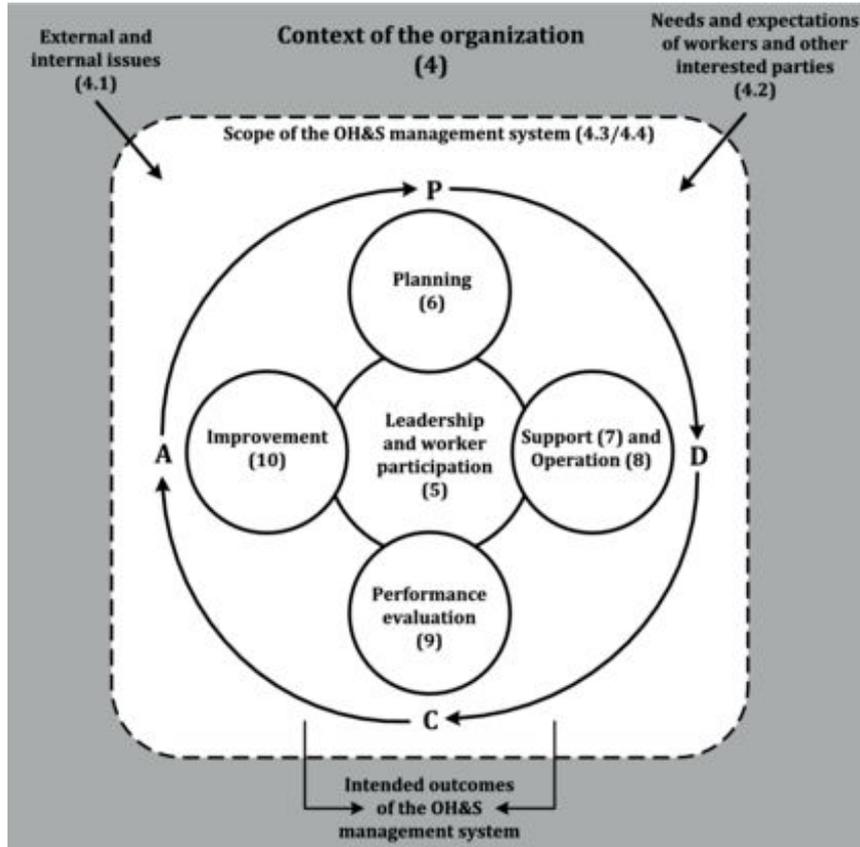
- ✓ Focus on mental health of employees
- ✓ Focus on the need for a *management system* rather than the management of any individual set of occupational hazards,
- ✓ Focus on involvement of top-level leadership and collaborative employee participation
- ✓ Does NOT address issues such as product safety, property damage or environmental impacts
- ✓ *Similar structure to ISO 14001*, with documented policies, targets, compliance protocols, and focus on improvement

# ISO 45001 : FOCUS

- ✓ Employee mental health (45003)
- ✓ Need for a *management system*, not of any individual hazard,
- ✓ Involvement of top-level leadership and collaborative employee participation
- ✓ Does NOT address issues like product safety, environmental impact or



# IMPLEMENTING ISO 45001 : 2018



**1 Identify**  
all the process and activities at your place of work

**#ISO45001**

**5 tips** to keep your workers healthy and safe at work

ISO

**2 Check**  
with the help of the workers themselves whether any activity has significant associated hazards that could cause harm?

*Some dangerous situations/processes to watch out for include working at height, moving parts in machinery, electrical equipment, chemicals, construction activities and farm working operations, etc.*

**3 Reduce**  
risks that can lead to serious injury (accidents or long term sickness) by removing the hazard, modifying the work process, protecting workers, etc.

*Examples include long term exposure to handling heavy items, radiation, noise, vibration, visual display screens, chemicals etc.*

**4 Verify**  
whether the measures you have in place to protect workers are working properly and that rules are being followed.

**5 Improve**  
by always looking out for what could be done better and more safely.

# ISO 45001 BENEFITS

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- ❖ Adherence to *all major national and international legal requirements* for employee health and safety,
- ❖ *Increased efficiency* by integration with other ISO systems,
- ❖ Improved *employee morale* with collaborative leadership,
- ❖ Better public *image*, enabling international engagement
- ❖ Ripple effect to subcontractors and vendors in the chain



**IRIS 45001 : 2018**  
**(or ISO/TS 22163 : 2017 +)**



# IRIS or ISO 22163 : 2017 CERTIFICATION

- ❖ IRIS = International Railway Industry Standard, that is
- ❖ Managed by **UNIFE** = Association of European Rail Industry
- ❖ Aims to **increase quality and efficiency** in the rail sector through a universal evaluation system of assessment guidelines and audits,
- ❖ Largely based on **ISO 9001 : 2015 plus Railway-specific requirements**,
- ❖ General quality guidelines of ISO 9001 applied to Railway products and services to meet standards and enhance **customer satisfaction**

# IRIS Certification® rev. 03

Objective

Transparent

## ISO/TS 22163:2017

Railway applications - Quality management system - Business management system requirements for rail organizations: ISO 9001:2015 and particular requirements for application in the rail sector

## IRIS Certification® Conformity assessment:2020

Rules for achieving and maintaining IRIS Certification® recognition

## IRIS Certification® Technology

GOLD



SILVER



BRONZE



Audit-Tool

Portal

Database

### ***Impact on BMS:***

- ❑ Project-, Change- & Configuration Mgt
- ❑ Obsolescence Mgt,
- ❑ RAMS (Rel., Availab., Maint., Safety),
- ❑ LCC (Life Cycle Cost)
- ❑ First Article Insp<sup>n</sup>

SYSTEM

REFERENCE

TOOLS

# IRIS IN INDIA

- ❖ Currently 2172 active IRIS licenses worldwide,
- ❖ Several are in India also →
- ❖ Major Railway PUs are IRIS certified: *RCF/KXH*, *MCF/RBL*, *ICF/MAS*, *BLW/BSB*
- ❖ Major suppliers like NEC,



# IRIS CERTIFICATION BENEFITS

SYSTEM INTEGRATORS	EQUIPMENT MANUFACTURERS	OPERATORS
<ul style="list-style-type: none"><li>❑ Improve quality among various production sites</li><li>❑ Simplify the process of evaluating and approving suppliers</li><li>❑ Remove the need for own-approval audits</li><li>❑ Have access to accurate and reliable data from one common IRIS web database</li></ul>	<ul style="list-style-type: none"><li>❑ Enter and update data on the IRIS platform</li><li>❑ Information of successful certification can be made available to all systems integrators and prospective clients</li><li>❑ Attain higher visibility in the industry</li><li>❑ Save time and money by increasing efficiency</li></ul>	<ul style="list-style-type: none"><li>❑ Mandatory requirement for participation in the European rail industry</li><li>❑ Gain improvements across the entire supply chain, enhancing both railway equipment and rolling stock systems</li><li>❑ Useful image- and brand-building</li><li>❑ Regular audits mean that the organization mgt system remains updated</li></ul>



# **5S SYSTEM & CERTIFICATION (NPCI / QCFI / JUSE)**

# 5S CONCEPT & WORKING PRINCIPLES

- ❖ Japanese workplace organization method to maximize productivity & efficiency,
- ❖ Sometimes regarded as part of 6σ or 6s system,
- ❖ *“A place for everything and everything in its place”*



# 5S : SORT



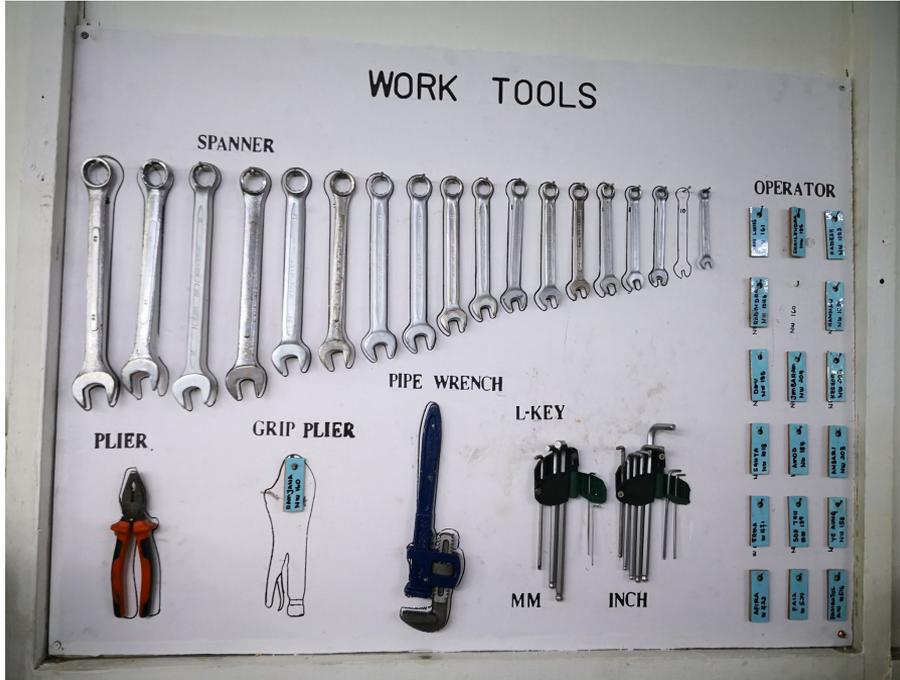
BEFORE



AFTER

**Sort** and discard unnecessary items in the workplace, arrange the rest

# 5S : STRAIGHTEN



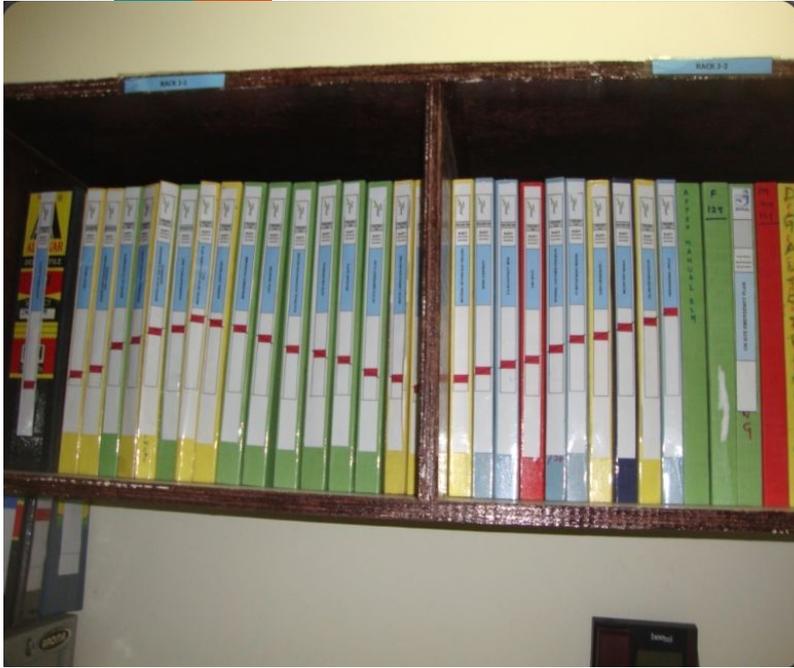
*Set in order* to allow necessary items to be picked easily without waste of time

# 5S : SHINE



***Shine*** up and clean the workplace completely leaving ***no dust or dirt*** at all

# 5S : STANDARDIZE



**Standardize** housekeeping & workplace organization systems to high level

# 5S : SUSTAIN



*Sustain* this system by inculcating behavioural change through regular training

# 5S CERTIFICATION IN INDIA: PROCEDURE

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## REGISTRATION:

Organization can register to become part of the NPC or QCFI for this purpose of training and certification



## PRE-AUDIT:

Industrial visit by the certification body/team for preliminary survey and handholding



## CERTIFICATION AUDIT:

The certifying body brings its team for a step-by-step check of adherence to 5S rules



## CERTIFICATION:

Based on the score obtained, a certificate is awarded at one of 5 levels, validity usually 3 yr

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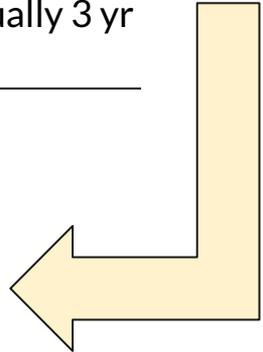
## RECERTIFICATION:

After certificate validity, the organization can reapply for certification and update certification scope based on their requirement



## SURVEILLANCE AUDIT:

During certificate validity, the certifying body carries out an annual surveillance audit for score update/upgrade



# 5S SYSTEM AND CERTIFICATION BENEFITS

EMPLOYEES	MACHINES & TOOLS	MATERIALS & WIP	PRODUCTS & CUSTOMERS
<ul style="list-style-type: none"><li>❑ Disciplined, more aware, motivated to improve</li><li>❑ Better team spirit and co-operation</li><li>❑ Discipline to follow safer and better work styles</li></ul>	<ul style="list-style-type: none"><li>❑ Early problem identification &amp; diagnosis</li><li>❑ More accurate with longer lifespan &amp; less breakdown due to daily cleaning and regular calibration and servicing</li></ul>	<ul style="list-style-type: none"><li>❑ Smoother flow of materials and WIP</li><li>❑ Organized Floor space</li><li>❑ Inventory of materials and WIP become clearly visible</li><li>❑ Reduced material handling time and cost</li></ul>	<ul style="list-style-type: none"><li>❑ Clean workspace ensure dust-free final product</li><li>❑ High product quality</li><li>❑ Greatly enhanced image for marketing</li><li>❑ Higher rates of innovation</li></ul>



# **6 $\sigma$ METHODOLOGY & CERTIFICATION**

# WHAT IS SIX-SIGMA METHODOLOGY?

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- ❖ Six Sigma is a methodology that utilizes *statistical tools* and concepts to identify variations or defects in a process.
- ❖ Using measurement to reduce defects to virtually zero for every products, process and transaction, for the purpose of achieving **Total Customer Satisfaction** and enhancing shareholder value.
- ❖ Disciplined, quantitative approach for improvement of *defined metrics* in all aspects of the business,
- ❖ Drives the overall process of selecting the right projects based on their potential in improving performance metrics
- ❖ Selecting and training the right people to get good business results

# TOOLS OF SIX-SIGMA METHODOLOGY

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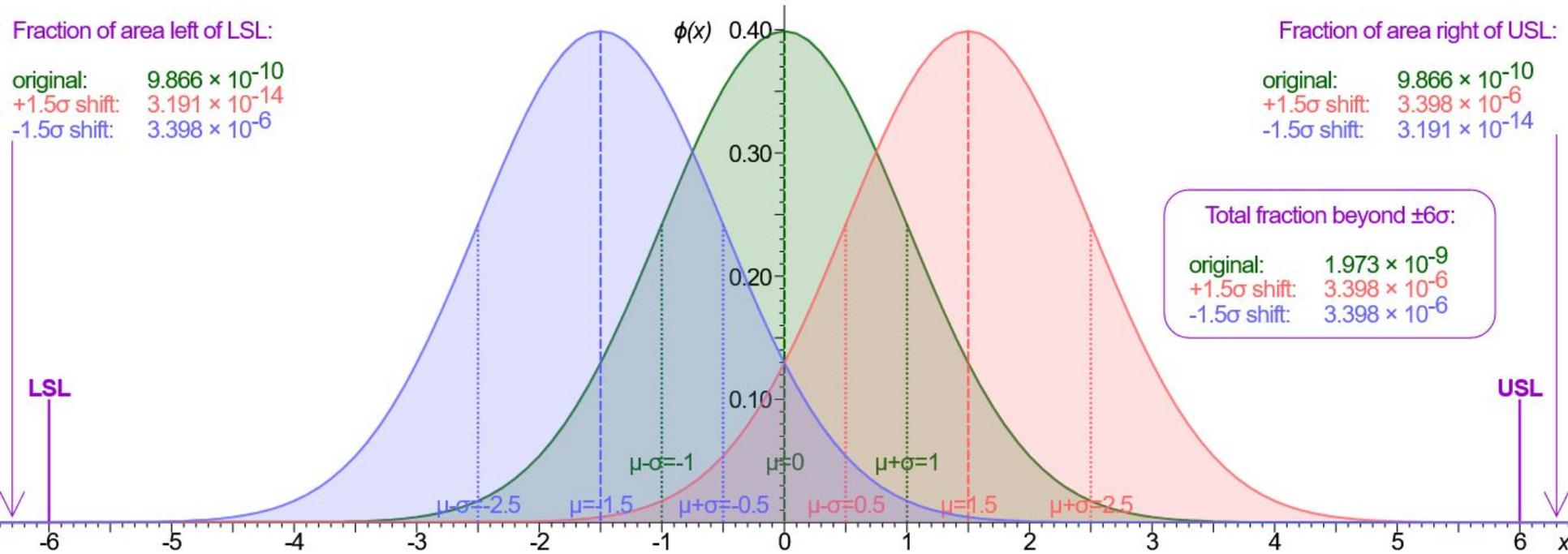
- ❖ COMPUTERISED DATA ACQUISITION
- ❖ PROCESS CONTROL CHARTING
- ❖ PARETO ANALYSIS
- ❖ ROOT CAUSE ANALYSIS
- ❖ FISH BONE DIAGRAM
- ❖ PERIODICAL EXECUTIVE REVIEWS

# SIX SIGMA SALIENT FEATURES

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- ❖ Process Measurement Methodology
- ❖ Helps improve the bottom line
- ❖ Customer Satisfaction Improvement Process,
- ❖ Specific methods to ensure near-zero defect operation,
- ❖ New definition in Quality = Near-Zero Defect
- ❖ 6-Sigma = 3.41 defects/Million Operations.
- ❖ 6-Sigma is about profit improvement

# UNDERSTANDING 6 $\sigma$



# 6σ PARADIGM: WHAT'S NEW ABOUT IT?

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## FROM

- Manufacture view of Quality
- Quality as an objective
- Results first
- Quality as conformance
- Internal quality push
- Ignore cost of poor quality
- Judgement-based quality decisions

## TO

- Quality in all functions.
- Quality as No.1 objective
- Processes first for consistent results
- Quality as a new way of doing things
- Customer-driven Quality efforts.
- Constantly communicate Cost of Poor Quality.
- Decisions based on facts.

# 6σ: INVOLVEMENT OF TOP MANAGEMENT

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- ❖ The Six Sigma journey is led from the top
- ❖ Top Management drive Six Sigma through their business
- ❖ Quality is No.1 objective for all employees
- ❖ All Management reviews begin with a review on Quality
- ❖ Organization leadership must engage with client on a near-daily basis for quality assessment & improvement

# SAMPLE 6 $\sigma$ PROJECT SEQUENCE

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- ❖ Leadership Jumpstart Event (2 days)
- ❖ Decision on Six Sigma Project teams
- ❖ Planning and baseline analysis
- ❖ Six Sigma **Champions Training** (4 days)
- ❖ Black Belt Training (Action Learning and Mentoring)
  - 5 Segments of training spread over 5 months
- ❖ Projects completed and Financial Benefits Validated
- ❖ Black Belts Certified after 2 Months' Sustained rise

White Belt

Yellow Belt

Green Belt

Black Belt

Master Black  
Belt

# 6σ METHODOLOGIES: DMAIC vs DMADV

DMADV



DMAIC



# 99% GOOD RESULTS IN...

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- ❖ At least 11,000,000 wrong drug prescriptions each year.
- ❖ More than 110,000 new born babies accidentally dropped by Doctors and nurses each year
- ❖ No electricity for 54 hours each year
- ❖ No television transmission for nearly 1:04 hours per week
- ❖ Four short or long landings per day
- ❖ 16 Railway accidents per day
- ❖ 16 minutes per week of unsafe water supply per day



**.... SO 99% IS NOT GOOD ENOUGH**

# WHAT DIFFERENCE DOES IT MAKE?

## 3 $\sigma$

- At least 54,000 wrong drug prescriptions a year
- Unsafe drinking water for about 2 hours per month
- Five short or long landings at O'Hare International Airport every day

## 6 $\sigma$

- One wrong drug prescription in 25 years
- Unsafe drinking water for one second per 16 years
- One short or long landing at all the airports in the U.S in 10 years



# **OTHER POSSIBLE CERTIFICATIONS**

# OTHER QUALITY CERTIFICATIONS

- ❖ ISO 3834 : 2005 certification for weld quality
  - ISO 3834-1 to -4 (ISO/TC 44/SC 10) for quality management in the field of welding, is a key certification including the usual ISO quality assessment standards and documentation, plus a *team effort* from the top for ground-level improvement (Welding Manager)
  - Aspires to the **EN15085** standard for welding of Railway vehicles
- ❖ ISO 26000 guidance on social responsibility (free, no charge)

# CONCLUSION: CERTIFICATION BENEFITS

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- ❖ Standard indicator of an organization's *competitiveness* and *environmental sustainability*
- ❖ Indian Railways is a key part of India's transport sector, and so must play a key role in promoting *sustainable mobility*
- ❖ To this end, there is a need for *policy framework* to stimulate modal shift. Various *process improvements* are also required
- ❖ These certifications are a good way for the Railways to assess and upgrade itself on an internationally recognized metric