



# Jamnagar Manufacturing Division

## *Best Safety Practices in Refining*



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# New Reliance for a New India



## Three mega growth engines and a strong liquid balance sheet

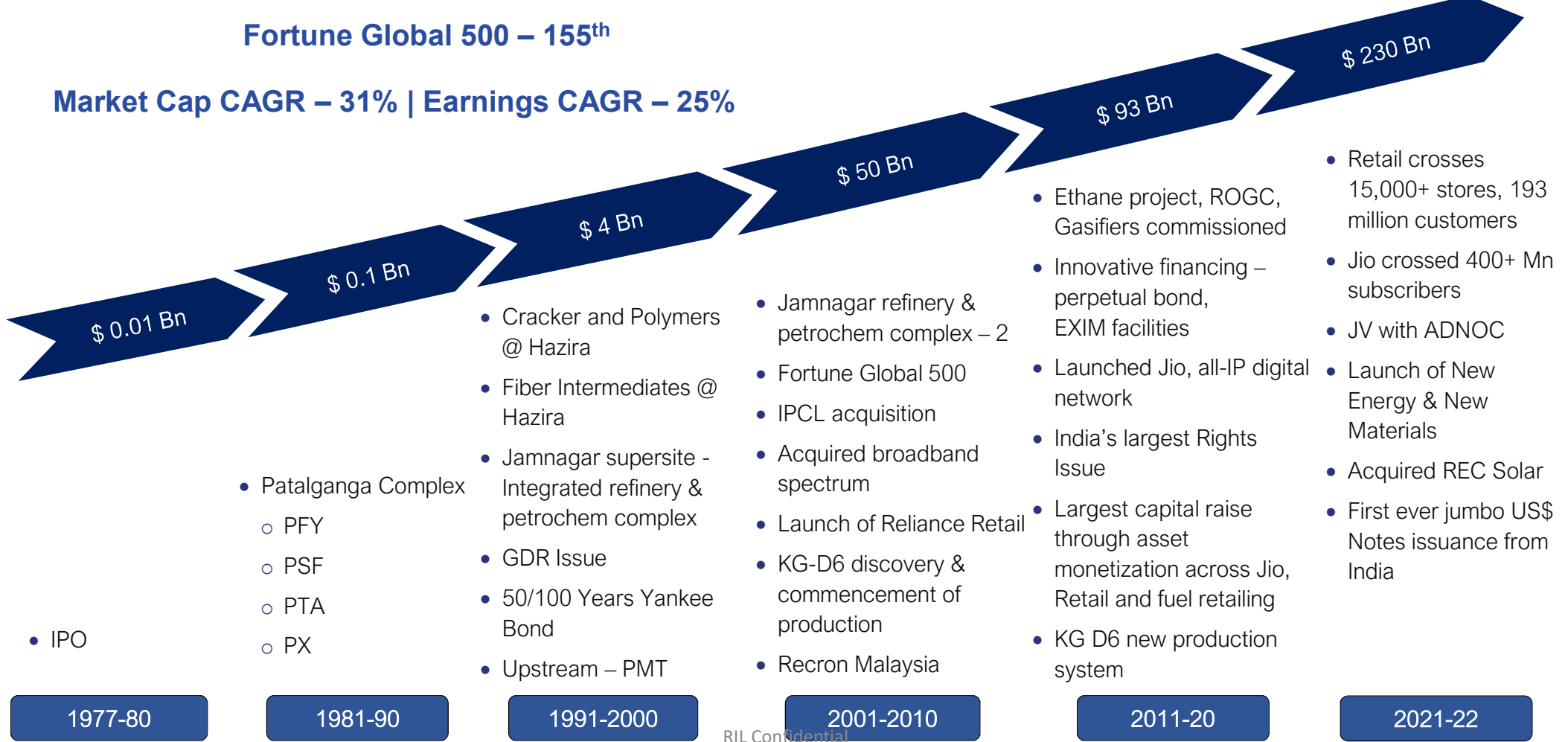
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• Note: Exchange rate used: US\$1 – INR 78.9725; <sup>1</sup> Outside China; <sup>2</sup>

# Phenomenal Growth Journey – Now A Top 100 Global Company

Fortune Global 500 – 155<sup>th</sup>

Market Cap CAGR – 31% | Earnings CAGR – 25%



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Note: CAGR since IPO

# Reliance's Vision to be Net Carbon Zero by 2035



## Opportunity to accelerate New Energy and New Materials businesses based on RIL's vision of clean and green development

- **Integrated Solar Photovoltaic module factory**
  - Establish and enable at least 100GW of solar energy by 2030
- **Advanced Energy Storage Battery factory**
  - Collaborate with global leaders in battery technology to achieve the highest reliability round-the-clock power availability
- **Electrolyser factory**
  - Manufacture modular electrolysers of highest efficiency and lowest capital cost
- **Fuel Cell factory**
  - Fuel cell uses oxygen from the air and hydrogen to generate electricity, emitting non-polluting water vapour

Deploy next-gen technologies to combat climate change

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# Growth Engines for Sustainable Value Creation



- **Best-in-class** digital services with pan-India all-IP mobile and FTTH connectivity
- Focus on **subscriber ramp-up**, **enterprise solutions**, **narrow-band IoT** and scaling-up of digital platforms



- Reliance is well-placed to leverage its online ecosystem and offline network to **maximize the reach across India's consumption strata**
- **JioMart** to create value for entire retail ecosystem by **partnering with** small merchants, kiranas and farmers



- **World-class, integrated O2C platform to sustain growth and profitability** through demand and commodity cycles
- O2C to maximize downstream, reduce transportation fuels and **create clean and green energy platforms**



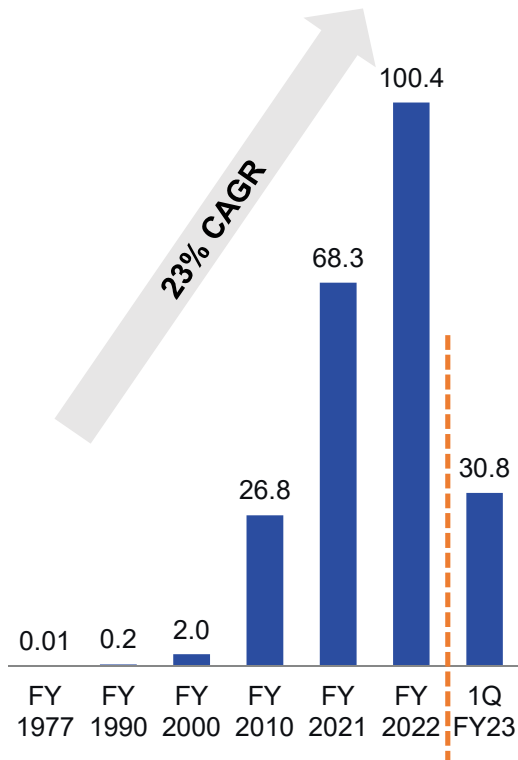
- Next big value creation engine – **New Energy and New Materials business**
- Technology and innovation focused partnerships in New Energy to achieve **Net Carbon Zero** by 2035

**Multiple engines of growth with focus on consumers and technology**

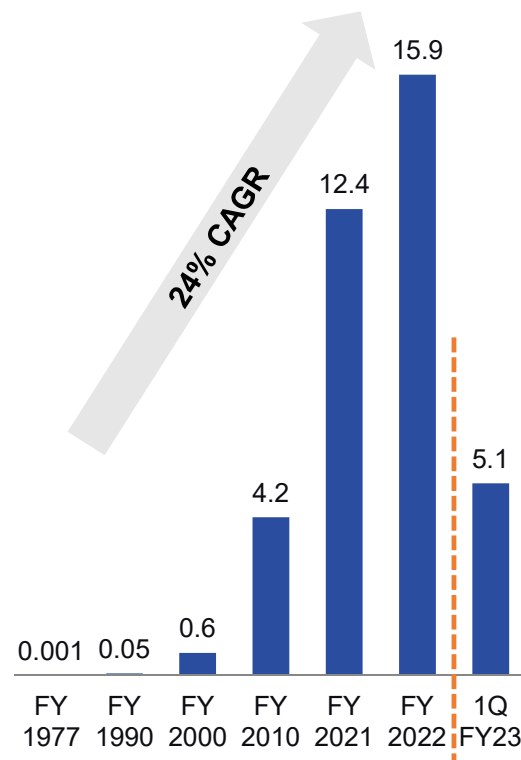
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# Robust and Consistent Earnings

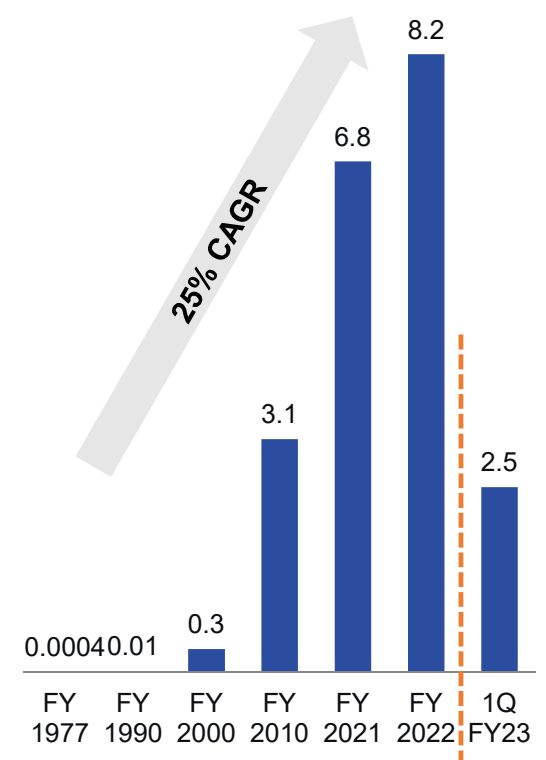
Revenue (US\$ Billion)



PBDIT (US\$ Billion)



Net Profit (US\$ Billion)



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Note: US\$1= INR 78.9725, CAGR since IPO in 1977

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# Overview of Safety Management System

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**Reliance**  
Industries Limited

**one**  
Reliance

## Our Vision

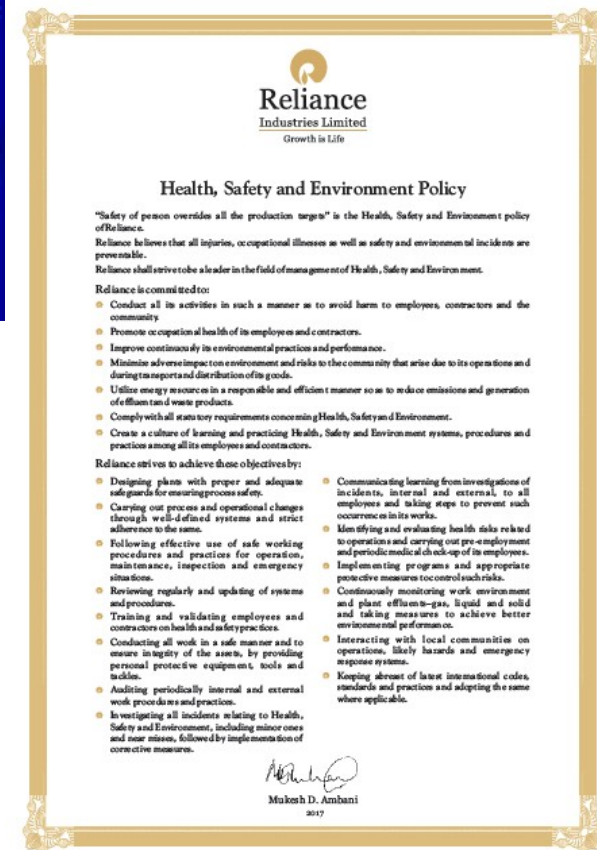
**“To be the World’s Safest,  
Most Reliable and Efficient  
Manufacturing Site”**

# Our Belief in HSE



**“All injuries, occupational illnesses as well as safety and environment incidents are preventable”**

**Mukesh D. Ambani**



**“Safety of person overrides all the production targets”**

# Commitment to safety



**“Safety of person overrides all the production targets” is the Health, Safety and Environment Policy of Reliance**

**Human Value**

**Reliance believes that all injuries, occupational illnesses as well as safety and environmental incidents are preventable**

**HSE Management Principle**

**Reliance shall strive to be a leader in the field of management of Health, Safety and Environment**

**Ambition**

**RIL strives to be a leader in field of management of HSE through Leadership commitment**

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# PROACTIVE MANAGEMENT

“PROACTIVE-M”

## Health and Safety Principles



# PROACTIVE MANAGEMENT

## Health and Safety Principles

<b>Prevention</b>	All injuries and illnesses can be prevented and all operating exposures can be controlled
<b>Reporting</b>	All incidents must be reported and analyzed
<b>Off the job Audits</b>	Off-the-job safety is also important Management audits are a must
<b>Correction</b>	All deficiencies must be corrected promptly
<b>Training</b>	Training employees to work safely is essential
<b>Involvement</b>	All employees must be involved
<b>Value</b>	Safety is our value, not just a priority
<b>Employment</b>	Working safely is a condition of continual employment
<b>Management</b>	All levels of management are responsible

# RIL Safety & Operational Risk Journey



2005	2007	2010	2015	2018	2021
<p><b>Thought leadership for HSE Transformation</b></p> <ul style="list-style-type: none"> <li>HSE Committee of Directors from RIL Board established</li> <li>6 Sites evaluated externally and benchmarked</li> <li>Centre for HSE Excellence formed within GMS</li> <li>DuPont (DSS) Identified as Strategic Partner</li> </ul>	<p><b>HSE Transformation with DuPont (DSS) Engagement</b></p> <ul style="list-style-type: none"> <li>18 Month Strategic Engagement with DuPont</li> <li>Behavioral Safety imbibed across all ranks</li> <li>Incorporated 14 elements of PSM into daily operations</li> <li>Over 65 Standards prepared and followed through procedures</li> </ul>	<p><b>Digitization and Business Transformation</b></p> <ul style="list-style-type: none"> <li>Mapped all processes with functional integration</li> <li>Digitized critical processes with built-in controls</li> <li>Reinforced MIQA through Maint. Business processes</li> <li>QRAs performed for high risk units</li> </ul>	<p><b>Operations Management System Implementation Across Entities</b></p> <ul style="list-style-type: none"> <li>Implemented Reliance Management System (RMS)</li> <li>S&amp;OR formed assimilating Centre for HSE Excellence</li> <li>Operating Management System embedded</li> <li>Risk Management Framework rolled out</li> </ul>	<p><b>Conformance Standardization Through Continual Improvement</b></p> <ul style="list-style-type: none"> <li>OMS Conformance – Min. Level 3 required</li> <li>Self-Verification process embedded</li> <li>Functional Assurance operational</li> </ul>	<p><b>Sustain OMS &amp; Embed HSE in Industry 4.0</b></p> <ul style="list-style-type: none"> <li>Complete transition to S&amp;OR Audits</li> <li>Embrace Industry 4.0 for enhanced Safety &amp; Reliability</li> <li>One Process – One Reliance</li> </ul>

# Holistic Safety

## Design

- Adopted 'Inherently Safer' approach
- Compliance to best practices, legal & other requirements (API, OISD, NFPA)
- Facility design for higher magnitude earthquake resistance.
- Hazardous area classification as per IS 5572 to limit ignition sources.

## Processes

- OMS & Competency Assurance System
- End to end Incident Management system from reporting to implementation of recommendations & sharing of Learnings
- Robust Change Mgt., Work Permit, Corrective Action Tracking, PSSR, Safety Observations recording, Contractor Safety Management etc.
- Implementation of Shutdown Safety Management plan.
- Implementation of SIMOPs in Brownfield projects

## Process Safety

- Pioneer in structured implementation of Process Safety Management in India
- Preparation of Technology-wise Risk Register.
- Reporting of Process Safety Events as per API 754

## Personal Safety

- Work Control & Risk Assessment implementation
- High risk jobs assessed based on Risk Assessment Matrix and Senior Leaders mapped for audit.
- Theme based Safety campaigns based on focus areas like Fire Prevention, Line Break, Material Handling Safety, Scaffolding, Incident Investigation etc.
- Roll out of 'T.H.I.N.K.' campaign
- Best in Class PPEs

## Integrated IT Tools for HSE Processes

Safety Observation System / Self-Verification	SAP- MOC
CAT	ReSOP
R- CoW	Contractor for IVR
Fire Protection Equipment	Pre Start-up Safety Review
Contract for Field Audit	Mock Drills

**Holistic approach to safety from design to operations using latest IT tools.**

# Safety In Design



- ✓ All structures designed for earthquake/seismic condition for higher than Zone 4 as per IS 1893
- ✓ Plant /marine facilities are designed to resist 500 yr. return storm, and serious wind damage in plant is highly unlikely
- ✓ Layout of refinery as per OISD and Bechtel standard. Substantial plant spacing for knock-on risk mitigation
- ✓ Video surveillance cameras to supervise risk critical areas
- ✓ Extensive F & G network with over 30 K devices installed
- ✓ All rotating machines above 500 KW power is monitored through MCMS
- ✓ Refinery wide DCS having interface with APC, MCMS, TIS, LIMS
- ✓ Automation schemes for decongestion of Panel Officers

**Best in class inherent Safe Design and Engineering design practices**

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# Safety Management – Work systems

- ❑ **Permit to Work**
  - ✓ Elaborate system of e-work permits on R-CoW.
  - ✓ Defining authorized person and extent of authority based on Risk level.
- ❑ **Operation logging**
  - ✓ OMPRO/ODR and e-logs
- ❑ **Scheduled checking of interlocks and trip**
- ❑ **Safety Review**
  - ✓ PHA conducted for all plants and modifications
  - ✓ PSSR conducted for all startup
- ❑ **Management of Change (MOC)**
  - ✓ Well defined and documented procedure for MOC – Tech & Personnel.
  - ✓ PHA review conducted and finding implemented along with the change
  - ✓ Risk Assessment carried out prior to implementation of change



**Aligned work forces + Robust safety management systems = Superior Results**

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# Safety Management – Work systems

## □ Control of Hot work

- ✓ Philosophy of using alternatives to eliminate hot work.
- ✓ Job safety analysis, risk assessment prior to hot work.
- ✓ Trained fire watch during the job.

## □ Control of Vehicle

- ✓ Minimum number of vehicle in the ISBL
- ✓ Spark arrester is mandatory for vehicles in ISBL

## □ LPR –ZT



Everyone returns home safely each day

**Strongly committed to continual pursuit in Goal Zero**

# GOVERNANCE OF DAILY HIGH RISK JOB

- Each and every HRJ being discussed in department daily Morning Safety Meeting.
- HITRA being reviewed by Section Safety Heads & SMs before execution of jobs along with O&M. Super Critical HITRA being reviewed by HSEF Head
- HRJs audit by respective auditor, SMs, Section Safety head & HSEF Head.
- Observations were corrected on spot, communication being done through Mail, SOS and SV.

Daily High Risk Tracking Report for the Day- 20-Jul-2021 (DTA)									
Released By : INSasidhar.Yella									
Sr No	Plant	Area	Description	Severity/Likelihood	Risk Colour	Key Hazards Risk Involved	Mitigation Measures Taken	Sponsor	Auditor
1	FCC	411	RCSP expansion joint redtop tube cutting, plugging and welding job	others	E4blue	1.Fire Hazard 2.Failure of bellow/pipe during pipe welding. Exposure to hot catalyst 3.Grinding wheel flying off causing injury to surrounding persons 4.High atmospheric temperatures 5.Personnel injury due to sharp edges	1.Ensure no combustible/flammable material in near by vicinity and Keep fire water hose and fire extinguisher ready. 2.Protect the bellow outer ply with insulation during welding 3.Use grinding wheel of appropriate size, speed, with validity before expiry date and wheel to be locked with machine properly. 4.Body shall be kept well hydrated. Regular breaks to be taken during the job. 5.Be attentive and cover the sharp edges before start lifting and shifting.	Sh. Grish Sharma	Sh. Nilesh Joshi
2	FCC	413	4" Hot Tap stub welding job in 8" HP BFW line of ME-RF413-S04	others	E4blue	1.Fire Hazard 2.Exposure to High Pressure Boiler Feed Water 3.Welding on Live Equipment 4.Electric shock 5.Grinding wheel flying off causing injury to surrounding persons	1.Ensure no combustible/flammable material in near by vicinity and Keep fire water hose and fire extinguisher ready. 2.Radiography and thickness survey are available and in case of heavy leak, stop the job and evacuate the area. Isolate HPBFW battery limit valve and safe shutdown to be taken. 3.Welding to be done as per approved WPS and ITP. Maintain process flow such as velocity must be in the range of 0.4 to 1.75 msec. 4.Electric welding machine, work piece and electrode holder must be earthe	Sh. Grish Sharma	Sh. Hemant Puar
-----End of Report-----									



# SATURDAY-BUSINESS PARTNER ENGAGEMENT SESSIONS

➤ **Following topics being discussed & activities conducted during each session:**

- Discussion of Previous week / Month incident / High consequences near miss, “ Last minute visual safety talk” to avoid incident / injury

➤ **Agenda:**

- Safety Pledge & Contact-
- Area Maint. Manager – on “ Safety during painting & scaffolding”
- Area Operation Manager – on “ T.H.I.N.K. & Self-attentiveness”
- HSEF head – on “ Gist on Safety Performance and action for achieving zero incident / injury”
- Recognition of Good Citizens & IVRS reportees
- Vote of Thanks

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# THEMATIC → SAFETY RE-SENSITIZATION CAMPAIGNS

Thematic Campaigns for Risk Awareness are being done on regular basis:

- 1) "Line Break"
- 2) "Work at Height and Scaffolding Safety"
- 3) "T.H.I.N.K. and Self Attentiveness"
- 4) "Hot Condensate / Water Splash Hazard"
- 5) "IHC (Incidents of High Consequences)" Awareness
- 6) "Online Leak Sealing – Hazards & Consequences"
- 7) "Safe Drinking Water Alertness" Campaign
- 8) "WHY & Why Safety Rath"

*Oath by AFEs & Contractors*



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# QUARTERLY & HALF YEARLY SAFETY PERFORMANCE AWARD

➤ **“QSP Guidelines” emphasize on the below major parameters:**

- No Tier-1, Tier-2 - Process/ Fire/ Environment / Fatal or LWC /MTC Incident during the quarter
- Zero Overdue recommendations of CAT & Incident Investigation
- Establishing new initiative for risk reduction & report published for implementation by other Plants
- Near miss reporting per month
- No open SOS for closure
- OMS self-verification
- Fire Prevention Audit/Meeting compliance and MOM released
- No of Inhibited F & G devices without approval note
- Fixed Fire equipment Testing Compliance
- No. of Defeated Fire Fighting equipment (Fixed) without approval note
- LDAR report & Oil soak insulation audit report
- CAS self-verification by Plant team
- Standing as winner or runner in inter plant level Any competition considered which is associated with HSEF

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**QUARTERLY SAFETY PERFORMANCE AWARD  
DTA-HSEF**

We are pleased to announce the results of  
Quarterly Safety Performance award for Quarter-2  
(July 2022 - September 2022)

We highly appreciate the efforts put by all Plants Employees and  
Contractors for their performance in the previous quarter.



**HYDROGEN**  
WINNER



**DTA - HSEF**



**SULPHUR**  
RUNNER UP

Rank	Plant	QSP marks out of 900	Bonus point	Total Score
1	HMU	888	114	1002
2	SULPHUR	894	103	997
3	PP	898	87	985
4	CRUDE	895	89	984
5	COKER	893	83	976
6	HPIB/PRU	896	79	975
7	HT	893	80	973
8	FCC	890	79	969
9	CPP	893	72	965
10	RTF	884	80	964
11	AROMATICS	886	73	959
12	UTILITY	893	61	954

Congratulations to all Winners and best wishes to perform in next quarter  
**DTA - HSEF**

# MONTHLY RISK MANAGEMENT NEWSLETTER

❑ Publishing Monthly Risk Management Newsletter every 1<sup>st</sup> week of the Month

❑ Content Shared:

- Activities of HSEF
- Legal
- OMS
- Key KPIs/AOP Status
- Fire department activities
- CAS
- OHC highlights
- Campaign
- Focused Self Verification
- COVID
- Monthly Contractor Meeting Highlights

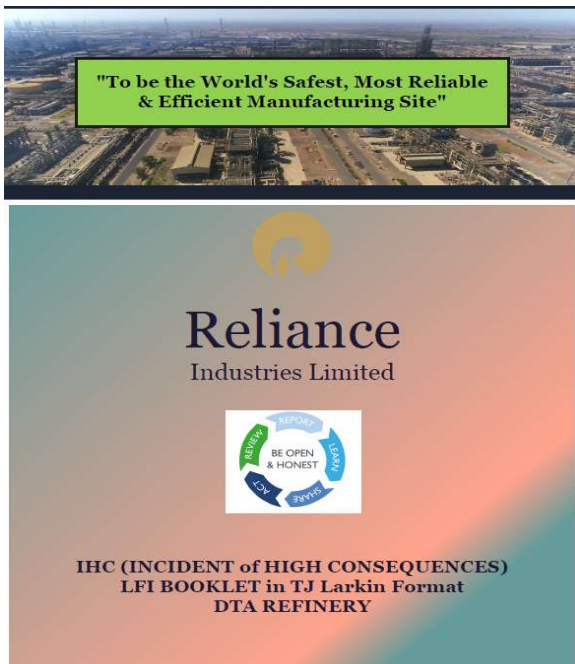
DTA -O&M:	SA %	MA %	AQ %	TT %	Over all progress
964 enrolled of 999 eligible - 96.49 %	99.00	99.00	97.80	97.80	93.30

	Task target	SA completed	L1 Completed	L2 Completed
DTA Operation 730 enrolled	67284	67283	95073	0610
DTA Maintenance 84 enrolled	3221	3221	3221	483

	Target
Nos. of High-Risk jobs done	216
Nos. of High Risk Job Audits conducted	43
Nos. of PRR conducted	20
Nos. of HITRA reviewed	21
Nos. of Process Safety Event (Process NMI)	1
Nos. of Non-Process Safety Event	86
Nos. of DTA Incident through Learning Forum	1
CAS task met by Fire/Safety Managers	28

KPI's	Target	Till date
LWCPR	<0.10	0
TFCPR	<0.20	0
PSI - Tier 1 / 2	0	0
LWC	-	0
RWC	-	0
MTC	-	0
FAC	-	2
Process Fire	0	0
Non Process Fire	0	1

- IHC Booklet
- TJ Larkin Format LFI
- LFI Booklet



**DTA Refinery** **DTA Safety Team**

### Importance of using Finger Saver

Are your Fingers out of the LINE of FIRE?

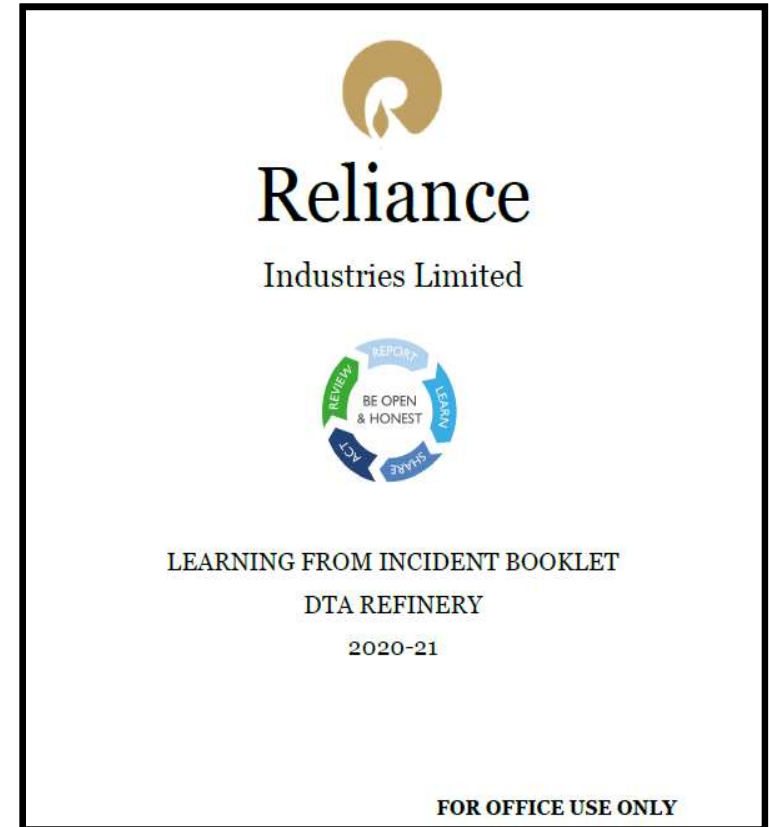
Follow the Best Practice, ensure your safety. Use the finger saver while hammering.

This Could Have been your Finger if the right technique was not used.

Always check the healthiness of your Safety tool.

If you don't do it right, you might see it Live!!!

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# SHARING GLOBAL LEARNING FROM INCIDENTS

- Incident was either released by CCPS/OISD/EPSC etc
- Applicable learning & corrective actions were also Shared with all.

### Furnace Explosion

EPSC Learning Sheet June 2021

**What Happened:**  
Operators tried to restart the tripped hot oil furnace of an FCC unit using a torch. At the third attempt the fire box exploded causing two fatalities.

The gas feed valve did shut very slow at the furnace trip, resulting in gas accumulation in the fire-box exceeding the LEL value.

**Process Safety Fundamental: Igniting burners**

**Aspects:**

- Cold furnace start-up requires flushing before ignition! Here the Burning Management System (that assures flushing) was bypassed by local operation of the gas feed valves.
- Furnace start-up requires a validated practical procedure that describes actions at all possible scenarios.
- Before ignition with a torch validate that LEL is below 1%.
- Ignition from a distance using pilots is preferred.
- Limit the number of restarts (e.g. never more than 3).
- Validate that the gas feed valves closes fast and completely.

**The Furnace box must be gas free before ignition!**

EPSC Learning Sheets are meant to stimulate awareness and discussion on Process Safety. EPSC can not be held liable for the use of this sheet. Questions or Contact via WWW.EPSC.be

Messages for Manufacturing Personnel  
[www.aiche.org/cspcs](http://www.aiche.org/cspcs)

Center for Chemical Process Safety  
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### Valve position errors can cause serious incidents

May 2021

**Figure 1**  
Storage Tank Fires

**Figure 2**  
Line Blind after incident

**Figure 2**  
Line Blind

**Figure 3**  
Piping Diagram

**Did You Know?**

- Manual valves may not be operated often and may not seal for many reasons such as worn seats, debris blocking the sealing surfaces and corrosion.
- There are many configurations for manual valves. If the correct position is not obvious, ask.
- Manual valves that are considered safety critical are often car-sealed or tagged in a given position. They deserve extra caution before operation.
- Line blind can provide a positive shutoff, but in most cases, changing position of line blinds can result in some leakage until completely resealed. Switching blinds should be handled like a line break and using a permit.
- Certain valving operations have a proper order of operation, this should be noted in the operating procedure.

**What Can You Do?**

- When changing valve positions, have the procedure and the PID or piping diagram with you to ensure correct operation. If the procedure or diagram does not match the piping in the field, Stop and ask before proceeding. The procedure or diagram may have an error.
- If you need to operate a line blind, ensure that it has been properly isolated and is truly safe to move. **Justicz** changing its position.
- If a valve is car-sealed in a position, the procedure should note this. If it is not called out specifically, verify you have the correct valve **before** operation.
- When operating any valve, it is important to verify all drains and sample taps are closed before operation. If the operating procedure calls for a specific order of operation for repositioning valves – follow it.
- If a valving operation is done by 2 or more crew, verify all valve positions are correct before proceeding.

**Take extra time to review the situation before operating manual valves.**

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## What Went Wrong This Day RIL-GMS- S&OR- LFI

WWWTDI/2022-12  
**6<sup>th</sup> Aug 2022**  
(Released by Group S&OR)

"Organizations have no memory, only people have memory and after a few years they move on taking their memories with them"  
Trevor Kletz.  
We as prestigious organization must prove him wrong by integration of learnings from LFI at each Plant

# Incident Detection and Response

State of the Art 40K F & G devices for timely detection

Auto operation of fire suppression system

Trained Emergency Response Teams

Multiple Display & panels for all stakeholders

Auto communication to identified stakeholders

Auto announcement of pre-recorded messages

Drill down to exact location

World class fire fighting system

## Level Of Emergency

**Level - 1:** Affecting any section of one plant/ area.

**Level - 2:** Affecting more than one plant within the complex.

**Level - 3:** Affecting the nearby community outside the complex.

All O & M role equipped with Personal Gas Detector

F & G device linked CCTV at critical areas

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High Volume Long Range Monitors



Tower Monitor



## WHAT'S GOOD FOR INDIA IS GOOD FOR RELIANCE

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"Our dreams have to be bigger.  
Our ambitions higher.  
Our commitment deeper.  
And our efforts greater.  
This is my dream for Reliance and for India."

*- Dhirubhai Ambani*

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# THANK YOU

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