PROCESS SAFETY AUTOMATION IN POL LOCATIONS

OISD Seminar

Presented by:
Sanjoy Bhattacharjee
Chief Manager (Terminal Automation)
IOCL (MD), HO

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Introduction

Terminal Automation System

- To co ordinate the entire operations of Receipt, Storage and Distribution of Terminals for a virtual unmanned fashion.

- The Measurement and Control system needs to take care of product movement, Reconciliation, Invoicing, Loss and Fraud Prevention, Security Access and Safety.

- Consist of various sub systems
Major Sub-systems TAS

- Real-time host (SAP) interface
- Load Scheduling, Card Attachment
- Third Party Interface
- PLC Interface
- Printers, Networking Components
- Access Control System
- Pipeline Custody transfer instruments
- Pump Control & Monitoring
- Tankfarm system Monitoring
- Weigh Scale
- Process Parameter Monitoring (Temp., Density, Pressure)
- Gantry Operations (Metering Control)
Safety + Security Solutions – Tank Farms & Gantry

- CCTV for process monitoring /Advanced analytics to capture oil spillage
- Hydrocarbon Detectors for any spillage
- Safety devices (Overfill, grounding), ESD
- Tank Gauges & Over fill protection
- Valves Ops from outside Dyke area incl Emergency Start / Stop PBs, Fire safe Cables
- Point & Open Path HC
- CCTV cameras for process monitoring/detect spillage
- RIM Seal Fire Detection by Cables
- Process Control & Safety Control PLC
- TFMS integration with SAP
- HMI/Servers
- CCTV for Process alarms
- Fire Alarm System

Tank farm

Office

MCC

Control room

Gate

Weigh Bridge

Parking area

CCTV Monitoring

Guard House

Truck Loading bays

Water Tanks And Pumps
What makes TAS Different?

Unlike process manufacturing environments, terminal automation requires minimal real-time process control, but significant business transactional capabilities.

However, unlike business environments, a hiccup in a terminal automation system can have severe consequences to human safety and the environment.

Terminal automation systems are unique.
Why Safety??

December 3, 1984: Lethal methyl isocyanate gas leaks from a pesticide plant in Bhopal exposing @5,00,000 people in surrounding community to tainted air and water. Confirmed death @4000 immediately after the incident. Govt official declaration in 2006 confirmed 5,58,125 injuries, 38,478 partially disabled and @3,900 permanently disabled.

April 26, 1986: Reactor meltdown at Chernobyl nuclear plant in present day Ukraine. Other than death toll put at 4000 to 9000 by UN, contamination of air, food & water for long periods.

July 6, 1988: Piper Alpha disaster – When the platform blew 167 workers out of 228 were killed off the coast of Aberdeen, in North Seas.


October 29, 2009: Fire at IOC’s Jaipur oil terminal.
Layers of Protection

- Basic Process Control System
- Operator Intervention
- Emergency Shutdown
- Physical Devices
- Cons. Mitigation
- Emergency Response

Process Alarm
Trip Level Alarm
Relief Set Point
Functional Safety is improved by implementing a so called SIS (Safety Instrumented System) including necessary numbers of SIF’s (Safety Instrumented Functions).

Risk Assessment of the plant defines the SIL (Safety Integrity Level) of each SIF.
**Definition & Difference**

**What is a safety instrumented system?**
Safety systems are designed to respond to conditions of the plant, which may be hazardous in themselves or, if no action were taken, could eventually give rise to a hazard. They must generate the correct outputs to prevent the hazard or mitigate the consequences.

**Difference between Process System & Safety Instrumented System:**
- More signal loops would be encountered in SIS due to the requirement of the below:
  - Reliability and availability of Processors, I/Os and associated components.
  - Monitor Health and loop of I/Os.
  - Partial stroke testing.
  - Logics and Programs developed with blocks defined for Safety Instrumented Functions.
  - Are normally Discrete I/Os connected to dedicated PLCs.
System Components of Safety Instrumented System

Standards meant to deal with Safety Systems:
- Initial Days ANSI / ISA 84.01

Afterwards:
- IEC 61508 (Products & Systems both in Automation & Machinery)
- IEC 61511 (Integration of various Products & Systems)
Development of standard started in mid 1980’s
Safety Standards for Functional Safety

**Functional Safety Standards**

IEC 61508 and IEC 61511 provide an adequate basis for:

- Risk Assessment of an industrial process
- SIS Design
- Product design
- SIL classification of SIF’s and products

Applicable Safety Standard

- Device Manufacturers
  - IEC 61508
- System Designers and Users
  - IEC 61511
IEC 61508 & 61511

**Purpose of IEC 61508:**

Basis for those involved in the development of electrical, electronic or programmable electronic systems which may have safety implications,

Drafting any other standard where Functional Safety is a relevant factor.

**Purpose of IEC 61511:**

Gives requirements for the specification, design, installation, operation and maintenance of a safety instrumented system, so that it can be confidently entrusted to place and / or maintain the process in a safe state.

This standard has been developed as a process sector implementation of IEC 61508
Components of Safety Instrumented System

SIF with three major parts: Sensor, Logic solver and Final element:

- Sensor
- Logic solver (e.g. PLC or DCS)
- Final element (Valve)

The safety function of a sensor has two major parts:
1. To ensure a correct measured value (self-check)
2. In case of a sensor error, the transmission of an error information to the safety system, e.g. the Logic solver
Safety System

Typical Interface between Basic Process Control System & Safety Instrumented System
11.2.4 IEC 61511–1, Clause 11, has a number of design requirements for a SIS. One item of concern is independence between the SIS and the BPCS.

A SIS is normally separated from the BPCS for the following reasons:

a) To reduce the effects of the BPCS on the SIS, especially when they share common equipment. For example if the BPCS and SIS share a common valve for shutdown and control, then in the event of a dangerous failure of that valve, it would not be available to perform a SIS shutdown function.

b) To retain flexibility for changes, maintenance, testing and documentation relating to the BPCS.

NOTE 1 The SIS normally has more robust requirements than the BPCS and the intent is not to subject the BPCS to the same robust requirements that are required for the SIS. However it should be noted that uncontrolled BPCS modifications can be a cause of increased demand on the SIS.

c) To facilitate the validation and functional safety assessment of the SIS.

d) Access to the programming or configuration functions of the BPCS may need to be limited to meet the modification management arrangements if the BPCS is combined with the SIS.
Areas of Separation in SIS & BPCS as per EN 61511

There are four areas where separation between the SIS and BPCS is generally provided:

1) field sensors;
2) final elements;
3) logic solver;
4) wiring.

Separation between the SIS and the BPCS may use identical or diverse separation. Identical separation would mean using the same technology for both the BPCS and SIS whereas diverse separation would mean using different technologies from the same or different manufacturer.

Compared with identical separation, which helps against random failures, diverse separation offers the additional benefit of reducing the probability of systematic faults and of reducing common cause failures.
Importance of Proof Testing

Avoiding failure requires inspection, preventive maintenance, periodic repair / replacement of parts, and proof testing to identify problems.
What is SIL

SIL stands for SAFETY INTEGRITY LEVEL

- SIL is a classification of a product’s or a Safety Function’s (SIF’s) ability to reduce the risk for accidents in an industrial process.

- The standards define four Safety Integrity Levels, SIL 1 to SIL 4, where SIL 4 is the highest safety level.
Terms Used in SIL Classification

FMEDA (Failure Mode, Effect and Diagnostics Analysis)

A given hardware is analyzed to evaluate its suitability for a specific application. Together with the investigation of the mechanical / electromechanical components this allows to define the device's failure rates needed for SIL determination.

Basically, three parameters resulting from FMEDA are used for SIL classification of the device:

- **HFT** (Hardware Fault Tolerance)
- **SFF** (Safe Failure Fraction)
- **PFD_{AVG}** (Probability of Failure on Demand)
Hardware Fault Tolerance

The HFT of a device indicates the quality of a safety function:

HFT = 0 Single-channel use.
A single fault may cause a safety loss.

HFT = 1 Redundant version.
At least two hardware faults must occur at the same time to cause a safety loss.

Through proved operation as well as different safety requirements the value of the HFT can be increased by ‘1’ according to IEC 61511
Safe Failure Fraction

This value represents the fraction of safe device failures. An SFF of 85% means that 85 out of 100 device failures do not affect the safety function of the device.

The SFF is used together with the HFT to determine the safety level in which the device may be used under consideration of these two values:

<table>
<thead>
<tr>
<th>SFF</th>
<th>HFT 0</th>
<th>HFT 1 or 0(1)</th>
<th>HFT 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 60 %</td>
<td>-</td>
<td>SIL1</td>
<td>SIL2</td>
</tr>
<tr>
<td>60-90 %</td>
<td>SIL1</td>
<td>SIL2</td>
<td>SIL3</td>
</tr>
<tr>
<td>90-99 %</td>
<td>SIL2</td>
<td>SIL3</td>
<td>SIL4</td>
</tr>
<tr>
<td>&gt; 99 %</td>
<td>SIL3</td>
<td>SIL4</td>
<td>SIL4</td>
</tr>
</tbody>
</table>

1) HFT 0(1): Single channel device with proved operation according to IEC 61511.
## SIL Demand Mode

<table>
<thead>
<tr>
<th>Safety Integrity Level (SIL)</th>
<th>Average Probability of Failure on Demand</th>
<th>Risk Reduction Factor</th>
<th>Safety Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$10^{-1}$ to $10^{-2}$</td>
<td>10 to 100</td>
<td>90 to 99%</td>
</tr>
<tr>
<td>2</td>
<td>$10^{-2}$ to $10^{-3}$</td>
<td>100 to 1,000</td>
<td>99 to 99.9%</td>
</tr>
<tr>
<td>3</td>
<td>$10^{-3}$ to $10^{-4}$</td>
<td>1,000 to 10,000</td>
<td>99.9 to 99.99%</td>
</tr>
</tbody>
</table>
Probability of Failure on Demand

**PFD\text{AVG} for the sensor part**

A generally accepted distribution of the PFD\text{AVG} values of a SIF assumes that 35% of the total PFD\text{AVG} is caused by the sensor part.

For a SIL 2 application the PFD\text{AVG} value for the total SIF should be smaller than \(10^{-2}\), hence the maximum allowable PFD\text{AVG} for the sensor part is \(3.5 \times 10^{-3}\).
SIL Loop Validation

SIL classification of a SIF (Safety Instrumented Function)

Sensor part

\[ \text{HFT} = 0 \]
\[ \text{SFF} = 92.1\% \]
\[ \rightarrow \text{SIL 2} \]

Logic solver part

\[ \text{HFT} = 0 \]
\[ \text{SFF} = 99.2\% \]
\[ \rightarrow \text{SIL 3} \]

Final element part

\[ \text{HFT} = 0 \]
\[ \text{SFF} = 91\% \]
\[ \rightarrow \text{SIL 2} \]

For the SIL classification based on the SFF value, the weakest part will count!

In order to achieve a SIL 2 for the SIF, all SFF values of the SIF parts have to comply with at least SIL 2!

\[ \text{PFD}_{AVG, \text{SIF}} = \text{PFD}_{AVG, \text{Sensor}} + \text{PFD}_{AVG, \text{Logic solver}} + \text{PFD}_{AVG, \text{Final element}} \]

Generally accepted distribution: \( \text{PFD}_{AVG, \text{Sensor}} = 35\% \) of \( \text{PFD}_{AVG, \text{SIF}} \)

For the SIF, the \( \text{PFD}_{AVG} \) has to be less than 0.01 for SIL 2

For the Sensor, the \( \text{PFD}_{AVG,G} \) has to be less than 0.0035 (35\% of 0.01) for SIL 2

<table>
<thead>
<tr>
<th>PFD_{AVG, SIF}</th>
<th>SIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \geq 10^{-2} \ldots &lt; 10^{-1} )</td>
<td>SIL 1</td>
</tr>
<tr>
<td>( \geq 10^{-3} \ldots &lt; 10^{-2} )</td>
<td><strong>SIL 2</strong></td>
</tr>
<tr>
<td>( \geq 10^{-4} \ldots &lt; 10^{-3} )</td>
<td>SIL 3</td>
</tr>
<tr>
<td>( \geq 10^{-6} \ldots &lt; 10^{-4} )</td>
<td>SIL 4</td>
</tr>
</tbody>
</table>

SIL 2 classified SIF

\[ \text{PFD}_{AVG} = 0.0049^* \]

acc. to IEC 61508 / 61511

* Proof test interval = 1 year
Safety System Basics

*K. I. S. S*

*K* – Keep
*I* – It
*S* – Simple
*S* – Stupid

**Acronym design principle noted by U. S. Navy.**
The KISS principle states that most systems work best if they are kept simple rather than made complex; therefore simplicity should be a key goal in design and unnecessary complexity should be avoided.
M B Lal Committee Recommendations

Overview of the Recommendations

- 30 % to 35 % of the topics deals with Safety in Process & Automation.
- Next 40 % to 45 % on SOPs, training, Change Management, Personnel Deployment.
- Rest 20 % to 30 % on other topics.
GANTRY AUTOMATION

• Loading operation Safety through
  ➢ Earth Relay
  ➢ Over Spill Detector
  ➢ Loading Arm Position Monitoring
  ➢ Interlock with ESD / Process PLC for safe shut down
PROCESS PLC

• Interface with various stand alone sub systems.

• Auto/Manual operations in coordination with TAS system of all instruments / Sub Systems as explained Area wise

• Manage and handle various Status from the associated instruments / Sub Systems

• Interlocks and manage functioning of associated instruments / Sub Systems.
Operations & Interlocks through Process PLC Sub System.

Pump Automation.

- Pump Sequencing, status monitoring and Auto Operation of Product Pumps
- Maintain running hour history
- Interface with VFD & Soft starter for Auto Operation and Parameter Monitoring (i.e. Power Consumption, VFD Speed and Status)
- Pump Interlocks

- **Pump interlock - example**
  - ESD/ Common Fire Alarm is activated.
  - Tank Outlet MOV/DBBV&/ROSOV status not “Open”.
  - Tank level “Lo Lo” Alarm
  - Tank is not in “Dispatch Mode”
  - Fire Water tanks level “Lo Lo” Alarm
  - All fire engine in “Local Mode”

- **Pump interlock - example**
  - Pressure transmitter detects high pressure at Product TLF header.
  - ESD/ Common Fire Alarm activated
  - Tank level “Lo Lo” alarm activated
  - Outlet MOV/DBBV&/ROSOV closed.
  - DCV failure/over filling at respective product loading points.
  - All fire engine put in to “Local Mode”.
  - Fire water tank level “Lo Lo” Alarms.
- **Operations & Interlocks through Process PLC Sub System.**
  - **Gate Barrier Control System.**
    - Access Control Of Tank Truck to only authorized Tank Truck.
    - Opening of Gate Barrier When ESD Pressed.
  - **Header Line Instruments.**
    - **Pressure Transmitter at Product Header and Pump Discharge Line.**
      - Real Time Pressure monitoring & Trending available on TAS System.
      - Generate HI & LO pressure alarm as configured for interlocked with Pump automation.
    - **Temperature Transmitter at Product Header Line.**
      - Real Time Temperature monitoring & Trending available on TAS System.
    - **Density Meter at Product Header Line.**
      - Real Time Standard/Observed Density monitoring & Trending available on TAS System.
      - Density Out-of Range Alarm generation & will be annunciation.
Operations & Interlocks through Process PLC Sub System.

- Tank Sequencing & MOV/DBBV Operation.
  - Tank Sequencing / Mode Selection from TAS HMI & status monitoring
  - Auto Operation of Tank valves, Header Line valves according to Tank Mode selected from TAS HMI.
  - Live Tank Parameter (Level, Avg. Temp., Ullage, Volume etc) monitoring and Trending.
  - Interlocks:
    - Overfill Protection interlock with Receipt valves.
    - Generating Header Line & Pump Discharge Pressure Interlocks with Header MOV/DBBV.
    - Tank valves Opening and Closing Interlock with Tank Mode Selection
    - Configuring and interlocking of Various Level Alarms (Level LO, LOLQ, HI, HH, HHH) with Associated Inlet / Outlet valves & Pump Trip.

- Water Tank Inventory and Bore-well Pump Automation
  - Auto Operation of Bore-well Pump to maintained Fire Water Level in Water Tank.
  - Live Water Level and Level Alarm Status Monitoring & Event logging of Bore-well Pumps.
Operations & Interlocks through Process PLC Sub System.

- Dyke Drain Valve & Water Draw-off Line Flow Switch Position
  - Status Monitoring, Generating Alarm, logging and Annunciation of Alarms.

- Additive & Blue Dye Dosing System.
  - Auto Operation of Additive & Blue Dye Dosing.
  - Auto Operation of Additive/Blue Dye Pumps.
  - Generating, logging and interlocking of LOLO Level Alarms with Pump Trip.
  - Live Additive Tank Level monitoring and Trending.

- Alarm Annunciation and Hardwired Control Panel.
  - Audio & Visual Annunciation of Critical Alarms.
  - Acknowledgement and Test of Alarm Annunciation.
  - Auto/Manual Mode Selection of valves & Pumps from Hardwired selector switch.
  - Open & Close of valves with Hardwired Push Buttons.
  - Close command of ROSOV with Hardwired Push Buttons.
Emergency Shut Down / Safety PLC

- SIL certified PLC.
- Maintain Safety of the plant by monitoring status of critical parameters.
- Safe shut down of the plant in case any parameters behaves as not desired.
- Respond to manual ESD pressed and safe shut down of the plant.
Operations & Interlocks through Safety PLC Sub System.

- Emergency Product Pump / VFD Stop.
  - Product Pump/VFD Stop when ESD Pressed.
  - TWD Receipt Pump Stop in case of Tank Level Alarm from AOPS of Tank selected in Receipt Mode.

- Gate Barrier Control System.
  - Opening of Gate Barrier When ESD Pressed.

- Hydro Carbon Detection System.
  - Real Time LEL Level of Gas Concentration monitoring & Trending available on TAS System.
  - LEL Level 20% & 60% alarm will be generated, same is interlocked with Hooters and will be annunciate and Logged in TAS system.
  - Alarm Limits will be configurable in TAS System.
Operations & Interlocks through Safety PLC Sub System.

ROSOV Operation & Interlocks.

Normal Operation

- Monitor operation of ROSOV in Local/Remote Mode from Field Selector Switch.
- Normal Open & Close Operation of ROSOV in Local Mode through Open & Close PB Pressed from LCS.
- Normal Close Operation of ROSOV in Remote Mode

Operation In case of Emergency.

- Monitor status of SIL certified relay O/P of Tank Gauges (Primary & Secondary).
- Close ROSOV in event of level from Gauges is reaches beyond the configurable level limits
- If ROSOV not closed in predefined time than It will be annunciate on Hooter and ESD will be triggered.
- On activation of SIL-2 Level Switch (HI-HI-HI) Distress call by Activating ESD and Alarm & Hooter in Control Room as well as at Pipeline Station, ESD Close Command for valves, Stop All pumps.
Operations & Interlocks through Safety PLC Sub System.

Fire Detection & Alarm Sub System.

- The Fire detection & alarm system shall broadly consist of the following:
  - Main control panel (In TAS Control Room)
  - Manual Call Stations. (Break Glass Type)
  - Electronic Hooters
  - Detectors with Fault Isolation Module (Photo Electric / Heat / Combination)
  - Repeater Panel (at Security Gate & P/L Control Room)
  - Integration with TAS PLC & other systems viz. Existing PA System, Electric Siren

- Fire Alarm interlocks can be configured
Operations & Interlocks through Safety PLC Sub System.

- Process and Power Emergency Shut Down
  - ESD Push button located in entire terminal at specific key locations
    - Control Room, TM Room, & S&D Room
    - TLF Gantry,
    - TLF/TWD Pump House,
    - Tank Farm System
    - Security Cabin etc...
  - In event of ESD input detected an alarm will be triggered and start automatic shut down & tripping of various instruments (i.e. Closing of ROSOV, MOV/DBBV, DCV, tripping of all Pumps and power shut down of various equipments.
  - HMI will show the location of ESD point in GUI and event will be logged in the system.
Operations & Interlocks through Safety PLC Sub System.

Invoking process ESD to ensure the following:

- Pop-up Window “EMERGENCY” on all TAS HMI and Logged.
- Blowing of wailing siren at the location
- Generate ESD in all BCU’s at gantry. All loading operations shall stop instantaneously. Open all mechanized barrier gate for smooth evacuation.
- Stop all process VFD, Soft starter, Conventional pumps irrespective of the mode they had been operating at.
- Close all MOVs (ROSOV&DBB) of on Delivery & Receipt line of the tanks irrespective of mode of the MOV i.e. whether Local or Remote Mode
- Closure of all MOVs on TLF header & at custody transfer point.
- Send an emergency signal to Pipeline pumping station, so that Pipeline Line Division can immediately take shutdown of downstream Booster Pumps for safety of pipeline and tank under receipt.
- Recording all TFMS parameters in the system for all the tanks including water tanks.
- Hooter annunciation as soon as ESD command is received
- System should send an SMS to location in-charge and State Operations Head
Operations & Interlocks through Safety PLC Sub System.

Invoking Power ESD to ensure the following:

- Power ESD should trigger after invoking Process ESD with configurable time Delay.

- Power ESD should initiate the following Power Shut-down action:
  - Power supply to batch controller will be powered off after the DCV at each loading point is 100% closed.
  - Power supply to radar gauges will be powered off.
  - Power supply to MOV power distribution panel shall be tripped after all MOV’s are closed.
  - Power Supply to MCC tripped.
  - Power supply to barrier gate will be tripped.
  - Power supply to critical load (Control Room, Fire Pump House, Three or Four High Mass, Emergency Light, Security Room, MCC Room Lighting) will not cut-off and remains “ON”
Tank gauging system – Basic Process Control

Typical tank gauging

Basic Process Control System
(Tank Inventory System)

Information to PLT Operators, SAP Connectivity

Tank

Level gauge

Actuator
(Valve / Pump)
Overfill Protection: Tank levels (based on API2350)

Drafted after Buncefield Incident
Any increase in level beyond the overfill level will result in loss of containment and/or damage to the tank. (All other levels and alarm set points are determined relative to the overfill level.)

**Overfill level (maximum capacity)**

The tank rated capacity is a theoretical tank level, far enough below the overfill level to allow time to respond to the final warning (e.g., the LAHH) and still prevent loss of containment/damage. It may also include an allowance for thermal expansion of the contents after filling is complete.

**Tank rated capacity**

The LAHH is an independent alarm driven by a separate level sensor, etc. It will warn of a failure of some element of a primary (process) control system. It should be set at or below the tank rated capacity to allow adequate time to terminate the transfer by alternative means before loss of containment/damage occurs.

Ideally, and where necessary to achieve the required safety integrity, it should have a trip action to automatically terminate the filling operation.

The LAH is an alarm derived from the ATG (part of the process control system). This alarm is the first stage overfilling protection, and should be set to warn when the normal fill level has been exceeded; it should NOT be used to control filling.

Factors influencing the alarm set point are: providing a prompt warning of overfilling and maximising the time available for corrective action while minimising spurious alarms - e.g., due to transient level fluctuations or thermal expansion.

**Normal fill level (normal capacity)**

Defined as the maximum level to which the tank will be intentionally filled under routine process control.

Provision of an operator configurable ‘notification’ also driven from the ATG may assist with transfers, though it offers minimal if any increase in safety integrity.
Extract from OISD 244

Annexure-1:
Critical Alarm Levels in Tank

- Overfill Level
- Safe Fill Level (HH)
- High Level (H)
- Normal Fill Level

Note: Settings to be such that under no circumstances the Safe Fill level is exceeded.
Schematic for Overfill Protection

FIELD

RADAR Gauge
+ SIL – 2 H Alarm Switch

CCTV for Detection of spillingage

Tuning Fork sw
+ SIL – 2 HH Alarm Switch

“A” or “B” Class Product Tank
Other Safety Signals like HC Detectors, Tank Dyke Valve,

CR

RC & Process Control PLC and HMI / MMI

DIRECT Connect

Safety Control SIL - 3 PLC

DIRECT Connect

1st Tank Body Valve or ROSOV

Activate Lamps, Hooters, Beacons

To SAP

FIELD

Multi Drop permissible

ADVANTAGES OF SCHEME
- Tuning fork switch will have HH Switch for Proof Testing
- 1oo2 Voting ensures SIL – 2
- Documentation of Proof Testing with time stamping and record
- Total compliance to Standards

1

2nd Tank Body Valve

DIRECT Connect

HH Soft Alarm

Independent HH Switch

DIRECT Connect

1

Actions as per API 2350 3.2.3

DIRECT Connect

Indipendent High Switch
Way Forward –

Bridging the gap?

& The Journey continues.......
Thank You

Wish you all a very Happy, Safe and Prosperous year 2014