



*Institute of
Instrumentation
Control and
Automation*

ELECTEK
Ex SOLUTIONS

Lic. No. EC005871

“EEHA CERTIFICATION” FPSO’S FOR INTERNATIONAL OPERATIONS

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AGENDA

- ▶ **Our company**
- ▶ **What is an FPSO?**
- ▶ **Legal requirements and Codes & Standards**
- ▶ **Different regulatory requirements**
- ▶ **Certification Process**
- ▶ **Case studies**
- ▶ **Robust documentation**
- ▶ **Conclusion**

INSPIRATION

- ▶ I would like to dedicate this presentation to the gentleman who raised the question on the AOG on 22/2/17.
- ▶ Thanks to IICA for this opportunity.
- ▶ Thanks to my friends who actively participated during the preparation of this presentation.
- ▶ **Think global and act local** became our motto.

- ▶ Electek is an electrical and communication company that has been privately owned and operating in western Australia and based in Perth.
- ▶ Established in 1985, Electek has a proud history and has managed to grow steadily since its inception, keeping pace with changes in industry and technology during this time.
- ▶ **Electek Ex Solutions** is a subsidiary company of Electek and is formed to ensure company growth in Explosion Areas, a natural progression.
- ▶ We are Authorised Technical Associates of: **ExVeritas** in UK

PerfEx

PD Soft.



ExVeritas[®]

- ▶ Australia has around 20 FPSO's in operation.
- ▶ What is an FPSO?



Reference: <https://aerodyne.wistia.com/medias/u2ovcq4711?wvideo=u2ovcq4711>

- ▶ FPSO's are assembled in Modules.
Refer to <https://youtu.be/kbs809lk9AY>

TERMINOLOGIES

- ▶ **Legal Requirements** Law, legislation
Directives/ Regulation
- ▶ **Explanatory Notes** Legal explanations for common
man - Interpretations
- ▶ **Industry Specific** Codes/ Standards
- ▶ **User applications** Compliance
Qualifications,
recognised competencies

IEC 60079 & ISO 80079

- ▶ **IEC 60079 series Standards are dedicated to the highly specialised fields associated with the use of Explosion protected equipment and installations in areas where a potential Explosive Atmosphere may exist (Fire and Explosion) . For Oil & Gas or Mining industry, Hazards mitigation codes are the same.**
- ▶ **IEC 60079:2013 series standards provides protection against Electrical ignition Hazards and ISO/IEC 80079:2016 provides protection against Mechanical ignition Hazards.**
- ▶ **AS/NZS 60079:2009 series standards are applicable in Australia for Hazardous Areas.
In UK , BS EN 60079:2014, Denmark DS EN 60079:2012**



REGULATIONS / REGULATORS/ ICP

An FPSO follows two regulations:

- **Shipside – Marine regulations**
- **Topside - Local & International Regulations**

Name of FPSO	Area of Operation	Regulator	Independent Competent Person	Remarks
Vincent	Australia (NWS)	NOPSEMA	LLOYDS	8000 tags Now in Production
Armada Claire FPSO	Australia (NWS)	NOPSEMA	LLOYDS	10000 tags Now not in service
Armada Kraken	UK Waters	OSDR	DNV GL	15000 tags Now in Production
Armada Olombendo	Angola Waters	Local	ABS	13000 Tags Now in production

- ▶ OPGSSA 2006 is the regulation in Australia and that leads to Safety Case and AS/NZ 60079 is used as code of practise.
- ▶ The AS/NZS 60079, Electrical apparatus for explosive gas atmospheres was adopted in 2008 and this code replaced AS 2381 standards.
- ▶ IEC 60079:2013 Part 14 provides full guidelines for initial inspections and guidelines for incorporating the data, including **Validation and Verification** activities.
- ▶ Documenting adhesions to AS/NZS 60079-17 is mandated (refer Section 4.1 & 4.2) and is called as Validation and we use Competent Personnel for Verifications,
- ▶ EEHA Dossiers is where we capture all compliance documentation.

- ▶ **ATEX is the name commonly given to the two European Directives for controlling explosive atmospheres:**
 - ▶ **Directive 99/92/EC (also known as 'ATEX 137' or the 'ATEX Workplace Directive')**
 - ▶ **Directive 94/9/EC (also known as 'ATEX 95' or 'the ATEX Equipment Directive')**
- ▶ **In 2016, ATEX directive 94/9/EC was revised and the new regulations came into effect.**
- ▶ **ATEX guidelines requires EPD (Explosion Protection Documentation) needs to be produced by the FPSO manufacturers based on Declaration of conformity (DoC) issued by skid manufacturers.**

ATEX & NLF

UK Government
Statutory Instruments:
Health & Safety
Executive
and
Safety Case Regulations



United Kingdom
Continental Shelf
(North Sea)

Each Product Directive is a part of or formatted within the UKCS HSE/SC Regulations:

Machinery
Directive



Low
Voltage
Directive



Pressure
Equipment
Directive



ATEX
Directive



EMC
Directive



**EVERY ITEM THAT FALLS UNDER A DIRECTIVE REQUIRES
UNIQUE TAG + CE Marking+ ATEX label.**

CE MARKINGS

- Under ATEX regulations, manufacturer takes responsibility of the products supplied by him with CE markings.
- Ultimately ship owners takes the responsibility as the Manufacturer, but the responsibilities should cascade down the line to the suppliers.
- Confusions within suppliers with regards to responsibility markings/ regulation compliance exists.
- Spread sheet

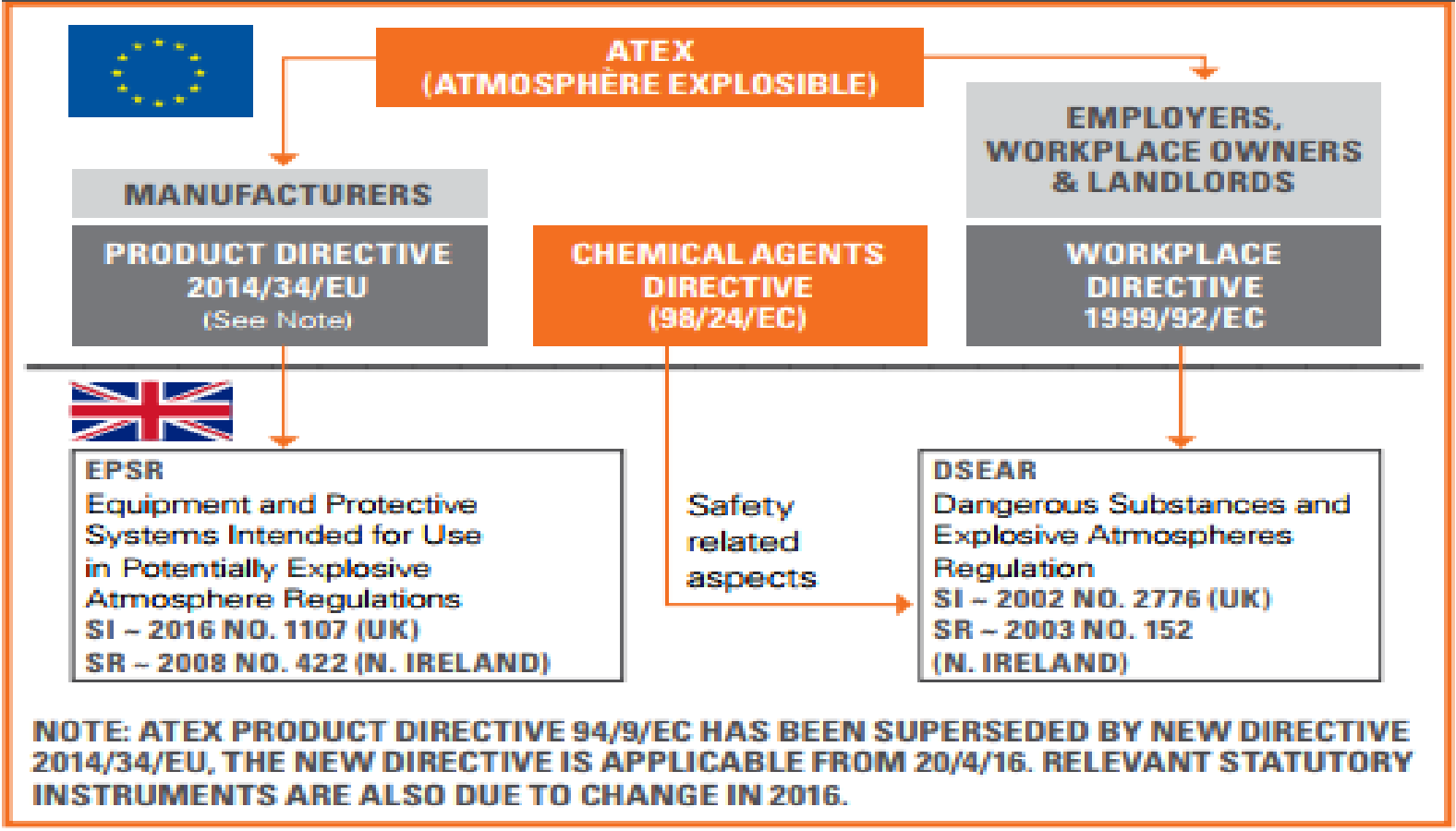


http://ec.europa.eu/enterprise/policies/single-market-goods/cemarking/professionals/index_en.htm



UK- EUROPE ATEX RELATIONSHIP

RELATIONSHIP BETWEEN EUROPEAN AND UK LEGISLATION



ATEX IN NON EUROPEAN REGIONS

- ❖ **ATEX is the name commonly given to the two European Directives for controlling explosive atmospheres:**
 - **ATEX 137 is applied to non European Areas, as per their local laws and Asset Owners requirement**
 - **Directive 94/9/EC (also known as 'ATEX 2015' or 'the ATEX Equipment Directive') may need to be followed, as per their local laws and Asset Owners requirement.**
- ❖ **EPD documentation remains the same.**
- ❖ **Role of the FPSO manufacturer: Owner and/or operator**

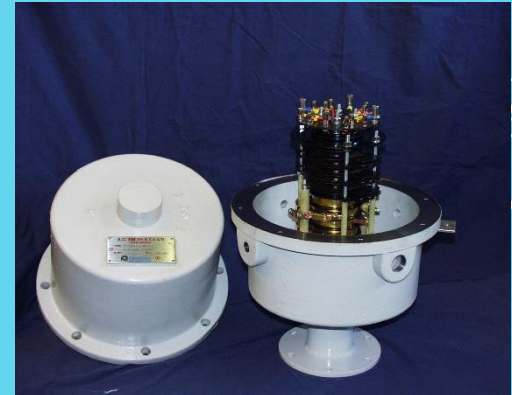
❖ **EEHA/ EPD is documented progressively and validation activities suffer a lot due to late vendor documentation**

- **Design**
- **Packages**
- **Construction management**
- **Commissioning**
- **Start up**
- **Maintenance (RBI etc)**

- ▶ **Equipment manufacturer provides Ex compliance documents for their products.**
- ▶ **The installation contractor provides the Initial inspection records in the form of a check sheet (as per AS/IEC)**
- ▶ **Our experiences have shown that the underlying data can be easily managed as a database.**
- ▶ **Validation and proof of field verification activities are provided by Engineers & Technicians.**
- ▶ **Verifications are provided by ICP's (Such as LRIS, BV, ABS etc)**

- ▶ In Australia we need to be compliant to AS 4761. RTO's are approved to conduct accredited training.
- ▶ AS 4761:2017 draft revision includes IEC Ex and also ATEX 95.
- ▶ “CompEx” UKAS accredited Private Training and certification scheme from JTL UK. BRITXIT???
- ▶ For example in Singapore, we cannot find persons from Australia and the shipyards cannot provide the qualified manpower to AS 4761.
- ▶ Tailor made bridging courses are to be conducted to staff for Engineers, Supervisors and charge hands by FPSO manufacturers.
- ▶ For Australian projects, Electrical supervisors are being utilised with Australian competencies and they have been asked to verify and accept all individual Inspection sheets.

- ▶ Glands, Ex p boxes and barrier glands certifications,
- ▶ Gland loose issues,
- ▶ Certification issues (ATEX/ EMC)



DISCONNECTABLE TURRET



LOOSE GLANDS CASE STUDIES



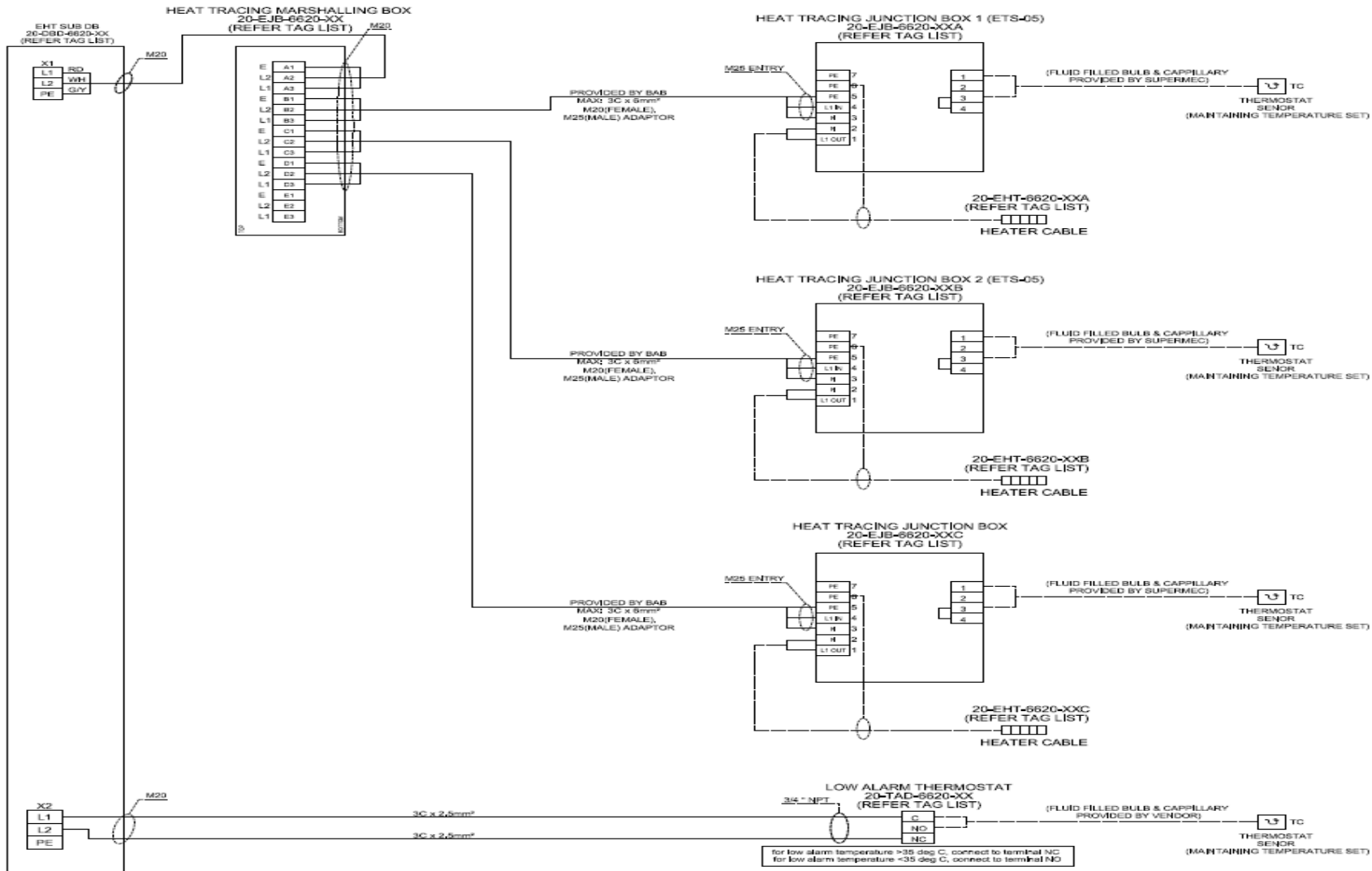
SYSTEM CERTIFICATION EXAMPLES

- ▶ **Tank Gauging System
(Zone 0 application)**
- ▶ **Heat Tracing Systems
(Zone 1 & 2 application)**

PHOTOGRAPHS OF HEAT TRACING SYSTEM



HEAT TRACING SYSTEM SCHEMATIC



- ▶ In construction sites, we have observed that the EEHA installation and inspection job progression is not a linear activity and is heavily dependent upon the Construction and Commissioning activities.
- ▶ IEC 60079 requires that every step including the competencies are documented, validated and verified.
- ▶ Number of software, web based solution were developed based on the site experiences to manage the data better on the internet from any where.
- ▶ PerfEx PD Ex Inspection & Dossier management system will also provide daily progress based on incorporated data.
- ▶ Refer to web site: <http://www.perfexpd.com.sg>

- ▶ Here to help those who require assistance to resolve a specific issue and provide certified solutions endorsed by Chartered Professional Engineers in collaboration with our technical associates (Notified body UK) and with your ICP
- ▶ Please refer to the web site:
<http://www.electekexsolutions.com.au>

SUMMARY & QUESTIONS?

Company	Web Address
	<p>www.electekexsolutions.com.au</p>
	<p>www.perfexpd.com.sg</p>
	<p>www.exveritas.com</p>

- Think Global and Act Local always brings in success.