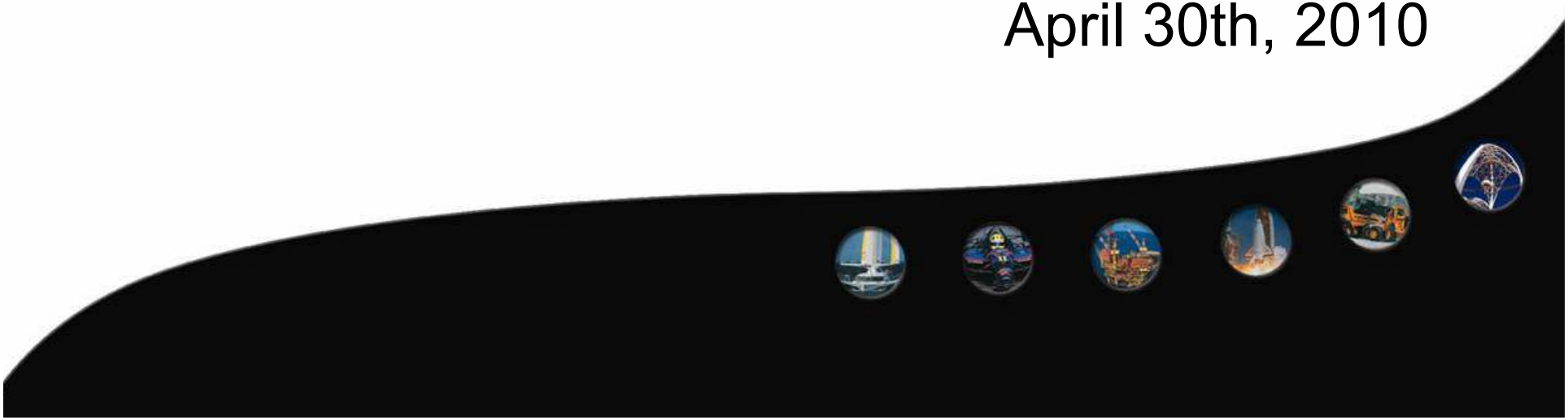
Getting SQEPed for Nuclear Industry

April 30th, 2010



Agenda

Getting SQEPed for Nuclear Industry

April 30th, 2010

7am PDT (Seattle) / 10am EDT (New York) / 3pm BST (London)

- Welcome & Introduction (Overview of NAFEMS Activities)
  - Matthew Ladzinski, NAFEMS North America
- Getting SQEPed for Nuclear Industry
  - Nawal Prinja, Ph.D., AMEC Nuclear
- Q&A Session
  - Panel
- Closing

Ladzinski

Prinja

THE INTERNATIONAL ASSOCIATION
FOR THE ENGINEERING ANALYSIS
COMMUNITY

An Overview of NAFEMS Activities

Matthew Ladzinski
NAFEMS North America

Planned Activities

➢ Webinars

- New topic each month!
  - Fire Modelling in CFD - May 26th
  - Visualization – Summer 2010
  - Practical Approach to Deformation Analysis – November 8th (NAFEMS Italy)
- Recent webinars:
  - "Accepted Practices in FEA" (NAFEMS India Webinar)
  - Product Performance Simulation in the Year 2020
  - What is V&V
  - How to Ensure that CFD for Industrial Applications is Fit for Purpose
  - Practical CFD
  - Composite FE Analysis
  - 10 Ways to Increase Your Professional Value in the Engineering Industry
  - Dynamic FE Analysis
  - Modal Analysis in Virtual Prototyping and Product Validation
  - Pathways to Future CAE Technologies and their Role in Ambient Intelligent Environments
  - Computational Structural Acoustics: Technology, Trends and Challenges
  - FAM: Advances in Research and Industrial Application of Experimental Mechanics
  - CCOPPS: Power Generation: Engineering Challenges of a Low Carbon Future
  - Practical CFD Analysis
  - Complexity Management
  - CCOPPS: Creep Loading of Pressurized Components – Phenomena and Evaluation
  - Multiphysics Simulation using Implicit Sequential Coupling
  - CCOPPS: Fatigue of Welded Pressure Vessels
  - Applied Element Method as a Practical Tool for Progressive Collapse Analysis of Structures
  - A Common Sense Approach to Stress Analysis and Finite Element Modeling
  - The Interfacing of FEA with Pressure Vessel Design Codes (CCOPPS Project)
  - Multiphysics Simulation using Directly Coupled-Field Element Technology
  - Methods and Technology for the Analysis of Composite Materials
  - Simulation Process Management
  - Simulation-supported Decision Making (Stochastics)
  - Simulation Driven Design (SDD) Findings

To register for upcoming webinars, or to view a past webinar, please visit: www.nafems.org/events/webinars

- Established in 2009
- Next courses:
  - Dynamic FE Analysis – May 11th, 2010 (*seven-week course*)
  - Non-Linear Analysis – July 13th, 2010 (*four-week course*)
  - Composite FE Analysis – TBA (*four-week course*)
  - Simulation-Supported Engineering – TBA (*four-week course*)
- Proposed course offerings:
  - Optimization – Fall 2010 (*four-week course*)
- For more information, visit: www.nafems.org/e-learning

What is on the Horizon for NAFEMS in 2010?

- Three Regional Conferences:
  - NAFEMS UK Conference – Engineering Simulation: Contributing to Business Success
    - Oxford, UK – 8-9 June 2010
  - Congrès NAFEMS France - Simulation numérique: moteur de performance
    - Paris, France – 12-13 October 2010
  - NAFEMS Nordic Conference
    - Gothenburg, Sweden – 26-27 October 2010
- One Virtual Conference:
  - NAFEMS 2010 Virtual Conference: 2020 Vision of Engineering Analysis and Simulation
    - Online, September 8th-9th, 2010
- For additional NAFEMS events and activities, please visit: www.nafems.org/events

What is on the Horizon for NAFEMS in 2011?

NAFEMS 2011 World Congress (NWC11)

- **THE** International Congress on Simulation Technology for the Engineering Analysis Community
- Brings together the leading minds in the simulation and analysis world, from industrial practitioners, consultancies, academic researchers and software developers
- Over 150 presentations from leading minds in the simulation and analysis community
- Workshops, discussion sessions and symposia
- Keynote presentations from major industry simulation users, as well as invited presentations from the top-level executives from the major software vendors

For information on NAFEMS 2009 World Congress, please visit: http://www.nafems.org/congress

NAFEMS

Getting SQEPed for Nuclear Industry

Professor Nawal Prinja
Technical Director
AMEC Power & Process Europe

Contents

- Regulatory requirement
- Advantages of SQEP Register
- Levels of SQEP
- Management of SQEP Process
- Example of SQEP Register at AMEC Nuclear

HSE NII SAP Requirement

52 An organisation needs adequate human resources, which means having the necessary competences and knowledge in such numbers so as to maintain the capability to manage safety reliably at all times, including during steady state conditions, periods of change and emergency situations.

53 The organisation structure and baseline staffing levels should be based on appropriate organisational design principles. Human resources baseline provisions should be established, controlled and regularly reviewed through robust, auditable processes. Changes to the organisation (eg structure, staffing, resources, competences), need systematic evaluation to ensure that they do not adversely affect nuclear safety management capabilities. This should include succession planning (especially where there is limited or singleton expertise). Succession planning should take into account expected changes (eg retirements) along with contingencies for the unexpected (eg resignations).

HSE NII SAP Requirement for Safety Case Processes

82 (e)

definition of training and qualification expectations for the formal roles within the process (to ensure that those who undertake the roles are suitably qualified and experienced).

EU Nuclear Safety Directive June 2009

(20) Maintenance and further development of expertise and skills in nuclear safety should be based, inter alia, on a process of learning from past operating experience and employing developments in methodology and science, as appropriate.

EU Nuclear Safety Directive

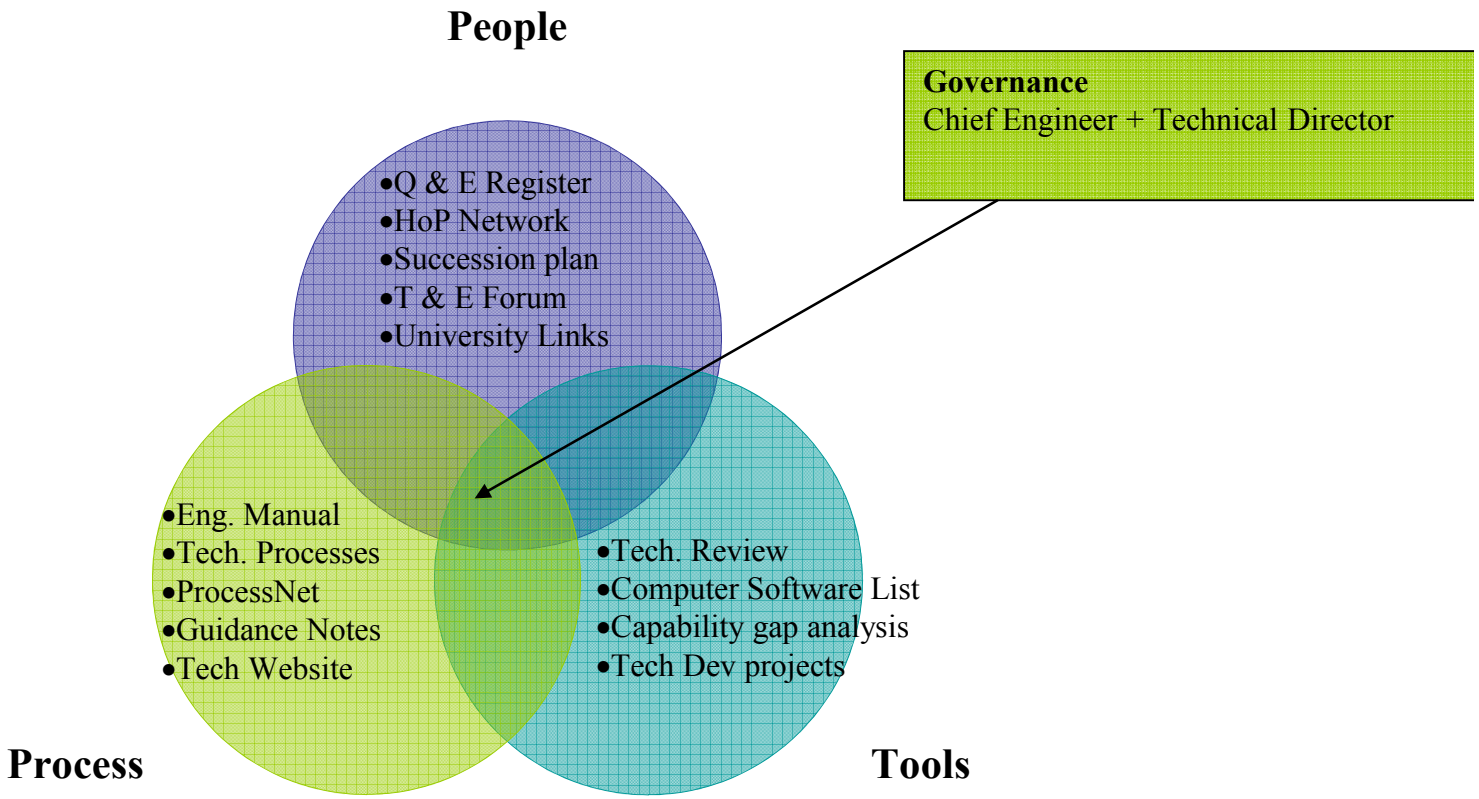
Article 7
Expertise and skills in nuclear safety

Member States shall ensure that the national framework in place requires arrangements for education and training to be made by all parties for their staff having responsibilities relating to the nuclear safety of nuclear installations in order to maintain and to further develop expertise and skills in nuclear safety.

Advantages of SQEP Register

- Method to assign, verify and demonstrate Technical SQEPness of our staff to clients.
- The repository for any client specific SQEP records
- The repository for staff CVs.
- A tool to monitor the skills and experience of all our staff and Agency Supplied Workers.
- A tool for Directors and Managers to obtain an overview of the health of our technical capability (i.e. X SQEP staff at skill Y)
- A tool to assist managers when carrying out Performance Reviews:
  - to assess the skills and experience against current role
  - to assist in identifying gaps and training requirements
  - CPD
- A tool to assist with knowledge management, capturing the experience and hence knowledge of staff.

Knowledge Management and SQEP



SQEP definition

- AMEC Nuclear defines a Suitably Qualified and Experienced Person (SQEP), as a person who has sufficient qualifications and experience in a defined skill area, to be able to implement that skill, at one of the five levels:
  1) Supervised
  2) Unsupervised
  3) Advising and guiding others
  4) Company “expert”
  5) Externally recognised “expert”

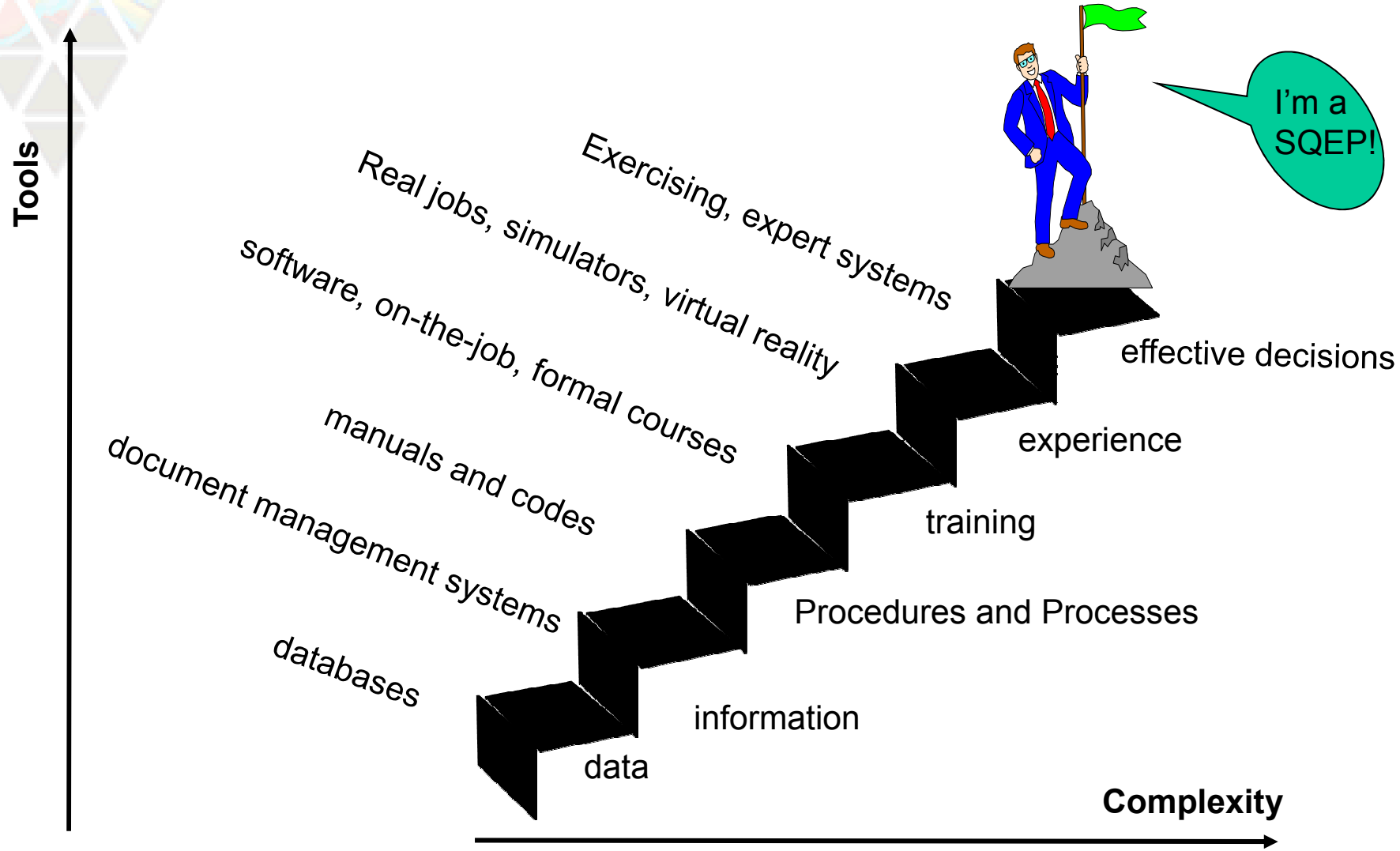
SQEP Levels 1 to 3

- **Level 1-Supervised** Can use the skill in a supervised capacity but not yet ready to take on general tasks without supervision.Or has worked in this area in the past, but is no longer familiar. Generally less than 2 years experience.
- **Level 2-Unsupervised** A person who can apply the defined skill in an unsupervised role, but is aware of their own limitations when faced with a new or novel problems when guidance would be obtained from a Level 3 or above. Generally 2 to 5 years experience in a narrow scope
- **Level 3-Advising and Guiding others** Can take on a range of complex novel tasks without supervision and can provide advice and guidance to others in the relevant disciplines. Generally 5+ years experience in a wide scope

SQEP Levels 4 & 5

- **Level 4-As a company "Expert"** Has expert knowledge and ability and is recognised internally by the Head of Profession as an expert in the field. Can provide independent advice to difficult and technically challenging tasks and Technical Leadership to the relevant skill area. Generally 10+ years experience
- **Level 5- As an externally recognised "Expert"** As per company expert, but is in addition recognised externally, by clients, peers in their profession, agencies and professional bodies and may sit on nationally or internationally recognised bodies. Generally 10+ years experience

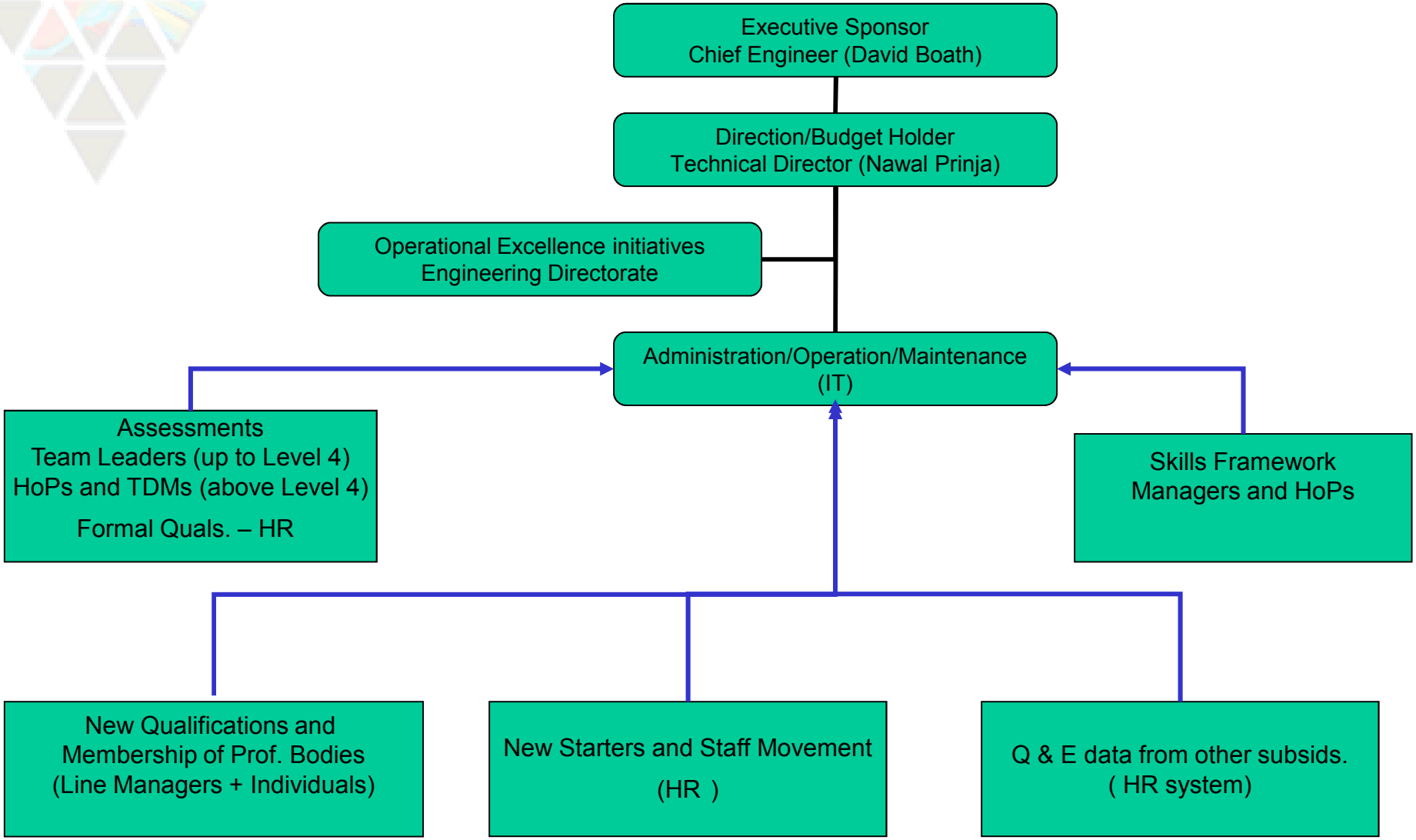
What makes a SQEP?



The SQEP as an expert

An expert has sufficient confidence, knowledge and understanding to be capable of inventing new and appropriate responses as new demands occur

Management of Q & E Register



Current Claims : Qualifications

Month	BSc	Post Graduate Academic Diploma	Post Graduate Certification Diploma	Masters	Doctor	Total
Jan'09	264	5	8	105	49	431
Jan'10	327	8	17	161	73	586

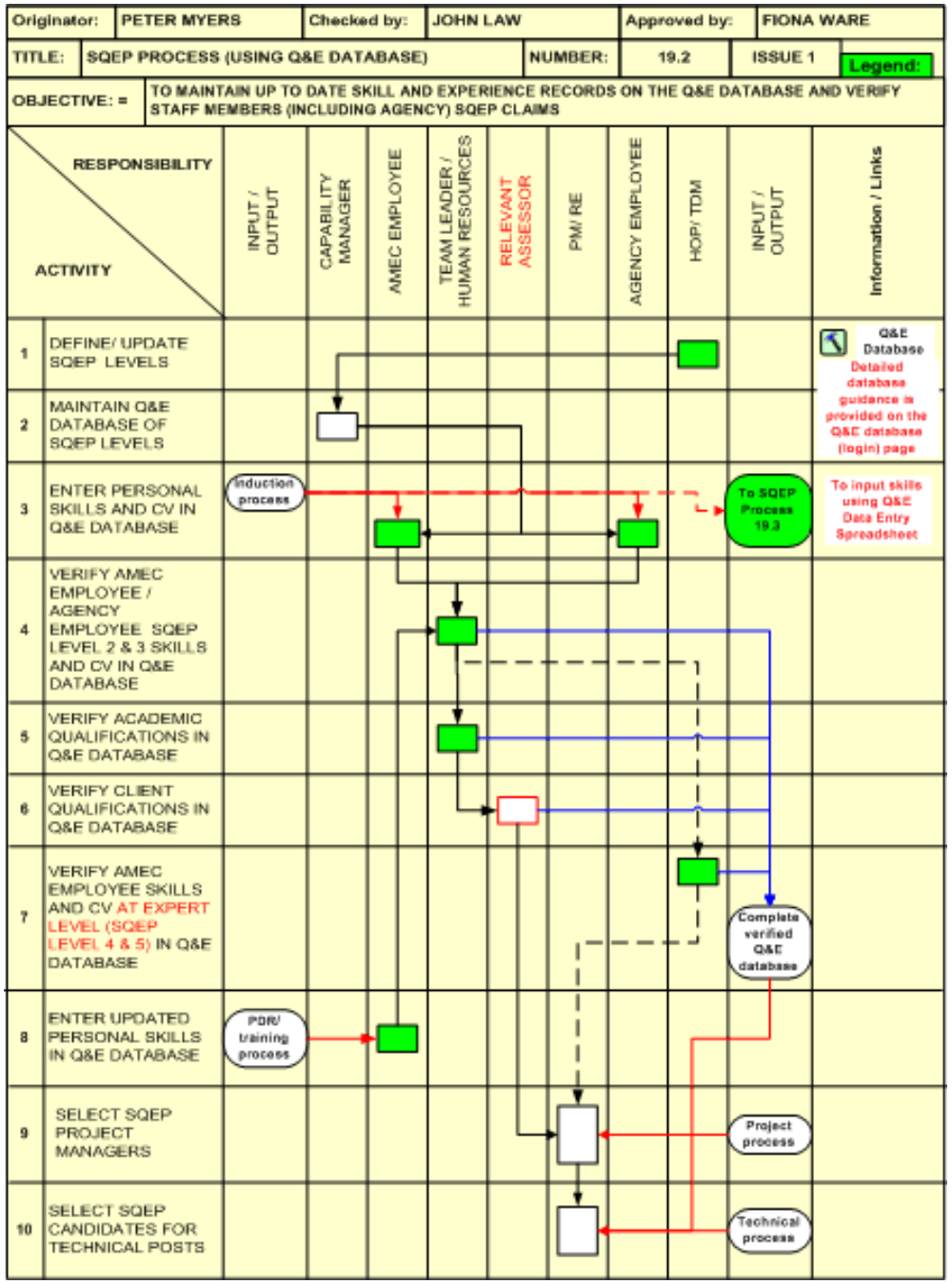
Professional staff only

SQEP : Skills Framework

Originator:	PETER MYERS	Checked by:	JOHN LAW	Approved by:	FIONA WARE	
TITLE:	SKILLS FRAMEWORK		NUMBER:	19.1	ISSUE 1	Legend:
OBJECTIVE: =	TO MAINTAIN UP TO DATE SKILLS FRAMEWORK IN Q&E DATABASE					

	RESPONSIBILITY / ACTIVITY	INPUT / OUTPUT	IT SPECIALIST	CAPABILITY MANAGER	HOP/ TDM	INPUT / OUTPUT	Information / Links
1	REVIEW LEVEL 3 SKILL AREAS REQUIRED FOR AMEC WORK AND AGREE DATABASE SKILL PROFILES				hop		
2	DEFINE THE GUIDANCE NOTE OR EQUIVALENT TECHNICAL DOCUMENT DESCRIBING TECHNICAL WORK SKILL AREAS	Periodic Review			hop	Technical Manual	Technical Manual
3	INPUT SKILLS FRAMEWORK INTO Q&E DATABASE			cm			Q&E Database Detailed database guidance is provided on the Q&E database (login) page
4	UPDATE Q&E DATA ENTRY SPREADSHEET TO REFLECT Q&E DATABASE		it				Q&E Data Entry Spreadsheet

SQEP
Data Entry



Current Skill Claims: Jan-Feb 2010

Number of staff claiming levels 1 - 5				
Level 1	Level 2	Level 3	Level 4	Level 5
441	531	451	185	44
Total individual claims for levels 1 - 5				
Level 1	Level 2	Level 3	Level 4	Level 5
5113	6092	4895	1097	149
Note : Does not include support skills				

Example of SQEP Level Data

Attribute	SQEP1	SQEP2	SQEP3	SQEP4	SQEP5
Structural Mechanics	64/9	52/12	26/10	9/5	4/0
Computational Fluid Dynamics	17/1	11/1	1/2	2/1	0/0
Computational Structural Analysis	36/3	26/4	17/8	3/2	3/0
Advanced nonlinear analysis	10/0	7/3	8/3	2/2	3/0
CAE Modelling	4/0	7/1	7/3	1/0	2/0
Contact/friction/sliding	8/0	9/1	4/3	1/1	2/0
Customised CAE & Simulation	5/0	6/2	3/2	1/0	2/0
Finite Element Analysis	25/1	19/2	11/7	2/1	2/0
Material modelling	7/0	9/1	9/4	1/0	2/0
Parametric Modelling	2/0	0/0	1/0	0/0	0/0
Rigid body dynamics	11/1	4/0	3/3	0/0	1/0

Permanent staff / ASW

Conclusions and Recommendations

- Nuclear industry is growing and requires SQEPed engineers as it is highly regulated
- A well managed SQEP process can bring consistency in demonstrating suitability
- Managing SQEP is good for business as well as safety
- Round robin data and schemes like the CCOPPS by NAFEMS is a useful source for Q & E
- Organisations like NAFEMS should continue to focus on SQEP issues

Questions

Website: www.nafems.org

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Thank you!