

A Suggestion for the Nuclear I&C Industries

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Approach to Nuclear Energy

Nuclear Industry faces wake-up call, says IAEA's Deputy Director General , Mr. Chudakov (WNA)

1. Vital Contribution to meeting climate change targets

2. Projected value to reach;

- 511GWe by 2030, 748GWe by 2050 (6%, High Growth)
- 352GWe by 2030, 356 GWe by 2050 (3%, Low Growth)
- 1000GWe by 2050 with new installed, 25% electricity consumption (Harmony Program)

3. Where is the 1000 GWe plus of new capacity? He added:” This should be a big wake up call for all of us.”

- “We need to consider new ways of learning and development for our workforce, alongside effective education, training and knowledge management to ensure we equip our people for the future,” he said.
- “Each of you has a role to play. We need you to be the drivers.”

Q: What should we, I&C people do to be the drivers for NPP industry now?

A: Surely, improvement of NPP's safety and availability by improving I&C Technology and product will be what we should do to be the drivers.

Global Trend of I&C Industries and New Issues of I&C Technology

- 1. Traditional big NPP suppliers** had been leading analogue I&C Technology. However, **an abrupt transition of I&C Technology from analogue to digital** deteriorated traditional big NPP providers' leadership in the I&C Technology sector.
 - **Who and which companies have led this FPGA workshop for ten years?**
- 2. Since the 2000s, new players** have been leading the **Digital I&C Technology**
- 3. Traditional NPP providers** that didn't prepare for digital technology **have used outsourced platforms under exclusive contracts**, which made traditional NPP providers' I&C Technology disclosure impossible; **new players became even stronger competitors**
- 4. Diversity issue made FPGA an I&C's new platform candidate**, and this FPGA application technology – **dominantly developed by new players** – has been growing in importance.

Budget Ratio of NPP in terms of labor, goods and materials(WNA 2016)

2. Capital costs breakdown in terms of labor, goods and materials				WNA(2016) World Nuclear Association
Item	Value	Unit	Remark	
Equipment				
- NSSS	12	%	RV & SG	
- Electrical, Generating	12	%	Electrical and Generating Equipment(T/G, Switch Gears and Cables..)	
- Mechanical	16	%	Mechanical equipment(Pumps, Valves and etc)	
- I&C	8	%	<i>I&C including software/Unthought but too big and important item (Many issues of former global projects) 40% of Nuclear Equipment</i>	
Construction Materials	12	%		
Labour onsite	25	%		
PM services	10	%	Project Management services	
Other services	2	%		
First Fuel load	3	%		
Total	100	%		

Suggestion for the proper Role of Nuclear I&C suppliers

Initiatives of I&C Industries

1. Improving NPP safety and availability, I&C and its developer's role have been being more important and will be crucial in the future.
2. Digital I&C has been already one of the big issues in NPP construction and life extension PJT. Cyber security is another important issue that digital I&C should be more focused.
3. Budget portion of I&C is 8% of NPP construction, while NSSS is 12%(2016 WNA report). It means I&C is no more a subsidiary system to NPP but a main system of NPP.
4. I&C experts and the important role of I&C Specialty Company is too much looked down upon in the NPP industries.
5. Above issues are similar to Autonomous Vehicle Industry, engine maker can not keep the dominating position in the car industry. Former Key Role of mechanical engineers in the car Industry should and/or already moved to ICT experts.
6. I&C vendors need to make an association such as WANICS(World Association of Nuclear I&C system Suppliers)

It's time to discuss about launching of global association of Nuclear I&C suppliers

- for **bigger contribution** through improvement of NPP safety and availability,
- for **better completion of responsibility**, and
- for keeping **self esteemed position**
- corresponding to the **technological and costal portion of I&C** in the NPP industry.

Isn't it?

Suggestion for Action Item

Action Item

1. Discussion on the suggestion during 11th FPGA Workshop (To go or not, tentatively)
2. Fix Milestone (If, yes)
 - Naming of the Organization
 - EX) WANICS (World Association of Nuclear I&C system Suppliers)
Similar to WANO (World Association of Nuclear Operators)
 - Organization Structuring
(Value of Association, Articles of Association including Location, Structure, Member Qualification and etc.)
 - Election of Boardmembers
 - Inaugural Assembly (hopely at the 12th FPGA workshop)
 - and other necessary preparations

**Everything to do to be NPP drivers is now in your hands.
Let's derive a tentative direction on the 4th date of this Workshop.**

**Many thanks, and
Good Luck for you all.**