7th CNS Int'l Steam Generators to Controls Conference - A Compliment to the Remarkable CNS 'OM+DM Utility Engagement Initiative'

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Abstract

We learned from CANDU Maintenance-Conference of December 2011, that it is our own 'ways-of-working' as service-providers for everything from plant-architecture to operational-support, that is holding back 'new-build' as well as 're-build'. CMC2011 addressed that by focusing on 'Needs-and-Interests of the Operating-Utilities'. SGC 2012 extends that by focusing firstly on 'Issue-Identification' to isolate 'items-needing-attention'; then on 'Issue-Definition' to define the 'work' required for 'Issue-Resolution'. It also pursues 'Task Leadership' as a competence, essential for '…making things happen'. These events and the CNS 'OM+DM [Operations&Maintenance and Design&Materials Divisions] Utility Engagement Initiative' are seen as complimentary initiatives toward such 'ways-of-working-improvement' objectives.

1. Introduction to -

7th CNS Int'l Steam Generators to Controls Conference
Metro Toronto Convention Centre, 11-14 November 2012

This paper describes the vision, focus, objectives, and organization of SGC 2012 and related companion events of the CNS OM+DM Divisions. That unfolded somewhat as follows -

As the senior-level utility consultations and the extensive exploration of 'ways-of-working issues' (as delineated in the Call-for-Papers of the Dec 2011 CANDU Maintenance Conference – Ref 3) progressed in preparation for the CANDU Maintenance Conference of last December (CMC 2011), it became clear that if our events where to achieve relevance in the rapidly-evolving nuclear industry which is in the middle of re-builds and hoping for the start of new-build - that it must develop a strong and effective focus on nuclear operations and operational support and on NIOU generally [Needs and Interests of the Operating Utilities]. This was a change from the traditional focus of such conferences on '… all things scientific'.

For SGC 2012 it became apparent that we needed to move on to a focus on Issue-Identification and Definition [I-I&D] as a vehicle for identifying items requiring attention and for defining their extent, their timing, and their resolution work-scopes – in other words '… for defining the opportunities for new work as is essential to move us forward'. Such an I-I&D focus allows those participating-in and those involved in the planning of this SGC 2012 event to see where '… they might be able to grab

hold' – i.e. – to see where opportunities may lie for meaningful engagement. That by the way is why people come to these OM+DM-type events in the first place.

This paper also discusses 'Task Leadership'. While everyone sees themselves as magnificent task leaders, Task Leadership is in fact a quite profound weakness in this industry – particularly at the 'front-end' where the 'foundational basis' for all that is 'new-build' must be built. Task-Leadership is something that can be taught to the very young but which is inevitably beaten out of even the brightest young engineers by the time they have taken their umpteenth course on mega-mega-mega-modeling.

Note that Task Leadership is not to be confused with the 'command and control' model – in which everyone expects to be designated as a 'manager' – regardless of their ability to lead, to inspire, to innovate, to communicate, to do root-cause, to do a process audit - or to just plain '… make something happen'.

This subject is of such importance that SGC 2012 not only discusses the attributes of such training and provides a training-course on the subject – but it is also planning to identify this as the inspirational Banquet-Speaker topic of the Conference.

2. 'Utility Engagement' & 'Scientific-Excellence' – Dual-Focus - It's Time Has Come

To allow an increased 'Operations and Operational-Support' focus, CNS after consultation among its lead members, has decided to implement an 'alignment' of the Operation & Maintenance and Design & Materials Divisions plus the Branches as is described below. This 'OM+DM Utility Engagement Initiative' as the alignment is called, is a remarkable initiative which will serve very well; the CNS, its Branch Members and particularly those at operating sites - and the Nuclear Plant Operations and Operational-Support industries.

The 'OM+DM Utility Engagement Initiative' in effect establishes within CNS a 'dual-focus' in which the needs and interests of the operating utilities (and thus the pursuits of their service providers of everything from reactor architecture to new-build to outage-inspection and maintenance) are supported via the Alignment - while the many other worthy and more-traditional pursuits of CNS are handled by its 'Scientific' side. Such a 'dual-focus' had been proposed to CNS a number of times over the ½ decade – and while such a dual-focus may seem disruptive by some, it has the advantage of allowing both sides to pursue their respective areas with the focus and rigor they require, while avoiding the 'all-things-to-all-people' syndrome.

Making this ultimately happen took commendable energy, leadership, and vision which flowed from some turning-point events and from some remarkable people as recognized in the Acknowledgements below – the involved Events include CMC 2011 and SGC 2012 as well as other events over the past half-decade.

3. SGC 2012 as Partner-Supporter to the OM+DM Utility Engagement Initiative

As indicated elsewhere, the concept of an OM+DM [Operations & Maintenance and Design & Materials Divisions of CNS] 'alignment' evolved somewhat in parallel with the advanced stages of organizing CMC 2011 and the initial work for SGC 2012.

While it is hard to say which came first, it is wonderful to see all three of these items moving forward. It is important because the new ways-of-working they embody are vital to our ability to '… get on with the future' of not-only operational-support and rebuild, but also if we are to have any hope of getting on with the important foundational work as required to initiate new-build.

It is expected that the relationship among the three entities will continue to build as planning progresses for successor-events in 2013 and 2014.

Needless to say, we of SGC and CMC are most pleased to do what we can to support the Utility Engagement Initiatives, to convey and promote its essential messages, and to build over time some kind of an OM+DM Network which can promote dialogue among all levels of those interested in Ops-Support – a 'Network News' is a possibility.

4. SGC 2012, Its I-I&D Focus, and Its Task-Leadership Training Initiative

For a comprehensive presentation of the focus, structure, and content of SGC 2012, you are referred to References 1 and 2. That material is too extensive to repeat here – and beside that, we have the ulterior motive of trying to get all of you to access our website and to think about what participation in this event can do for you - and for your technical, business, and career interests.

The 'Task Leadership Training Initiative' is discussed further in Section 6 below and in the Appendix, but a Few Further Points need to be made here –

a) As we discuss the Needs and Interests of the Operating Utilities (NIOU), we need to keep in mind that the Operating Utilities are the only customers there are in this business – and that their needs and interests are what ultimately drives (and funds) everything that we do. Even where such funding is provided by some level of government, expenditure-justification is ultimately based on providing essential support for the utility-industry

b) We, whether in plant architecture, manufacturing, maintenance, or operational support, are all 'Service-Providers'

c) In other words, none of us 'Service-Providers', not even the new-build architects, are 'the Customer'. The utility-customers bear the burden of being 'the customer' by dent of the accrual to their account of 'whatever comes' - in terms of costs/ delays/ waste-issues/ public-back-lash – or the economic benefits such as they may be

d) Clear-articulation of NIOU is a Utility responsibility – they must take the lead in making sure their need and interests are defined and articulated in a way that allows them to get what they require – and in making sure they actually get that at delivery time. That means they must insist pro-actively that the requirements for whatever is being done are clear *and* current. I.e. – that; i) things like SG tubing specification are 'state-of-art for 2012' (not the early 1970s), ii) that the state-of-art feeder manufacture currently under way for feeders is captured in a 'state-of-art for 2012' feeder spec and iii) that the requirements for control systems are likewise reduced to 'state-of-art for 2012' specifications, as the vitally-important 'analogue-to-digital conversions' move forward. Note that these and other 'Issues' will be listed as Issue-Identification items for SGC 2012

e) Clear requirements definition by the operating utilities does *not* mean they need to reduce every little detail to pre-initiation contract formality of the dialogue-paralyzing kind before any kind of issue-identification or issue-definition work can begin. It does mean establishing ways-of-working with service-providers who operate in a responsive manner - whereby appropriate control can be maintained - particularly within the issue-identification and issue-definition phases - while allowing the responsiveness, flexibility-of-mind-and-action, and innovative-ness that is so necessary for us collectively to move dynamically and competitively forward

f) 'Progress-compatible clarity' is a two-way street – for service-providers it means second-nature-familiarity with 'issue-resolution-planning' tools such as CPM (critical path method) for 'finding-the-way-through-the swamp'. It does not mean sitting in paralysis waiting for an enquiry-spec to arrive with an analysis task or whatever, fully defined - if you wait until then, the real problem-solving and task-leadership is already being done by someone else, and you are left scrambling with others for the crumbs – i.e. - the remaining/ un-differentiated/ generic/ low-profit/ un-interesting/ challenge-free/ work-scope

g) And for all involved 'Clarity' means – 'transparency-of-dialogue among the task-participants' (to ensure everyone is on the same page) – and 'tightly-maintained meeting-agenda and meeting records' (good old-fashioned agenda/ minutes to ensure all issues that need attention get discussed appropriately; that 'actions' are noted/ tracked; and so no-one whether in attendance or not has an excuse for forgetting or ignoring what was previously resolved; or for forcing each meeting to re-start again and again at the beginning because there was no record to define where to re-start)

5. Issue-Identification and Issue-Definition – Key to 'Getting-on-with-the-Future'

To be worthy of your time, effort and its cost, a working-meeting like SGC 2012 must provide move us forward in identifying and addressing 'what needs attention'. That is the purpose of Issue-Identification [I-I] and Issue-Definition [I-D] – the viability of our new-build aspirations going forward depends on that.

While all of this is discussed extensively in References 1 and 2 a few points need to be made here –

a) Issue-Identification [I-I] - In order for any item to benefit from the extensive expertise the industry has developed over the past decades, it must first be 'put squarely in front of us'. The listing of items requiring such consideration we refer to as 'Issue-Identification'

b) Issue-Definition [I-D] - Having thus identified the issue, it must then be definitively-characterized regarding its current status/ root-cause results/ planned approach to resolution/ resolution sub-tasks/ its need-date/ ability to be handled 'side-stream-wise'/ etc, etc. That we refer to as 'Issue-Definition'. Note that it is through such Issue-Definition work that the requirements for new work is set out – i.e. - such items are also known as '… business-opportunities of the very best kind'.

6. Task Leadership Training – A Highly-Essential Skill, Sadly Neglected

Task Leadership is that essential skill which allows a person, regardless of experience or organizational-status, to assume responsibility for achieving the rigorously-resolved outcome demanded by whatever the challenge at hand may be.

'Task Leadership' Capability – can be taught to the very young. On the other hand, many otherwise brilliant people go through their entire lives without coming close to mastering it. Note that 'Leadership' does not mean 'manager-ship' – or 'dictator-ship' – or 'my-way-or-the-highway-ship'.

Task Leadership Capability and some of its attributes and ways-of-working are presented further in Appendix 1 where its ways-of-working are noted in Items i) thru x) of Section 1 a). That may not be eloquent, but it does address some items which are often-neglected.

Note that for SGC 2012, Task Leadership will not only be the subject of a special Task Leadership Course at the Conference, but quite likely of the Banquet speech as well.

7. Conclusion

As has been noted in the Abstract above, we learned from the CANDU Maintenance Conference of December 2011 that it is our own 'ways-of-working' as service-providers throughout the areas from plant-architecture, to maintainability, to operational-support and everything in between that is holding us back as we work away at the current and up-coming 're-build' projects – and as we look forward hopefully to 'new-build'.

CMC 2011 started down the difficult road of trying to address that by focusing on 'NIOU' - the 'Needs-and-Interests of the Operating-Utilities'. That conference identified a wide range of essential items needed to re-build our ways-of-working competencies – see Ref 3.

At the prior Maintenance Conference (CMC 2008), it was realized that while people come to these events to learn, they often left feeling confused because the papers presented had become increasingly obscure and increasingly dependant on system and equipment knowledge which very few of the not-so-young, let alone the young, actually had. To that end a half-day course on Configuration Management was added – it was exceedingly well-attended by all ages, all experience-levels, all scientific-expertise-levels, and all affiliations – very gratifying indeed.

Identifying such ways-of-working and essential competencies was a good start – but it probably did very little for any young person who wants to '… makes something happen' and is desperately '… looking for a clue as to where to grab hold'. Somewhere along the line as we organized this SGC 2012 event we realized that – '… in our mature industry where everything has supposedly been studied to seamless-perfection by the respective world-experts, identifying items which need and will benefit from new work is a great problem' - and that it is a problem for the not-so-young as well as the young – and for those of any age with experience-from-elsewhere which they can exploit to the benefit of this industry, given half a chance.

Such a 'chance' we realized, could be quite-powerfully provided by the companion initiatives of;

i) 'Issue-Identification' - to identify and put in front of us '… such-items-as-need-attention' and

ii) 'Issue-Definition' - to define the '… work required for Issue-Resolution'. Such Issue-Definition work defines the; need-date/ relationship of such a side-stream task to its base project/ status of root-cause work/ CPM issue-resolution planning/ process-verification FMEA/ cost parameters/ etc. – and in the process, it in-effect delineates '… the business-opportunities which lie before us'

We also realized that in our world of computer-enforced isolation with its restrictions on interaction among task-participants let alone more-broadly – and where little is done which is not restricted to 'rigid-replication of the pre-existing', that some good solid training on basic Task Leadership principles is essential. To that end, SGC 2012 will have a 'course' on Task Leadership. That will be in addition to a new version of the above-mentioned course on Configuration Management – which will be given this time by younger people following the principle '…learning is never as effective as it is when you your-self do the teaching'.

In parallel with all of this, the CNS held consultations among its membership as to how its engagement with its Branches and it Membership at Operating Sites might be made more effective. It was realized that the focus of the Operations & Maintenance and Design & Materials Divisions, including as portrayed by these events, aligned with that of the Operating Utilities. To that end, the CNS set up the 'OM+DM Utility Engagement Initiative' – a truly remarkable initiative which is highly-complimentary to these events and their 'ways-of-working-improvement' objectives – as well as to the priorities and objectives of the Operating Utilities them-selves.

8. References

[1] "7th Steam Generators to Controls Conference, Concept Stage Advance Program", see www.cns-snc.ca >> SGC 2012 website

[2] "7th Steam Generators to Controls Conference, Call-for-Papers", see www.cns-snc.ca >> SGC 2012 website

[3] "9th CNS Int'l CANDU Maintenance Conference, Dec 2011, Call-for-Papers", see www.cns-snc.ca >> SGC 2012 website >> SGC 2012 News >> Item 3

9. Acknowledgements

Visionary-leadership during the 'participatory-dialogue' regarding the 'OM+DM Utility Engagement Initiative' and its eventual implementation which took place around the special Org-Strategy Workshop of a few months back, came from a number of very dedicated leaders of the Society – and particularly from;

- CNS President, Frank Doyle - who with his Organizational-Workshop of a few months back and his steady hand, established 'Utility Engagement' along with other initiatives
- CNS President-Elect, John Roberts
- O&M Division and CMC 2011 Conference Chair, Jacques Plourde
- D&M Division and SGC 2012 Conference Chair, Juris Grava

Appendix 1

'Getting On With the Future' - <u>A Task Leadership Training and Mentoring Program</u>

This section explores a few thoughts regarding 'Task Leadership' plus the related areas of 'Conceptual Design' and 'Planning-Planning-Planning' – give them a look.

Obviously, the following are requirements and attributes and not an implement-able program – as such they are rough, ragged, incomplete and not directly implement-able. But to the extent that these thoughts work for you, make them your own, build on them, and work them for all they are worth.

1. Task Leadership

Task Leadership is a profoundly-important skill for anyone young or not-so-young who is engaged in operations, operational-support, inspection & maintenance, repair, re-build, or in new-build-architecture work. The following are a few aspects of such capability for your consideration;

a) 'Task Leadership' – involves;
   i) being assigned the task (as a 'side-stream' activity which may progress in parallel with its otherwise-undisturbed 'main program')
   ii) assumption of responsibility-for (owning) the task
   iii) inviting-in all available expertise/ mentoring
   iv) defining the extent, need-date, and cost-parameters of the issue
   v) performing root-cause investigation to determine what the real, under-lying problem is (it's never what it seems)
   vi) identifying (using brain-storming where appropriate) the possible options and developing them
   vii) selecting, after an appropriate degree of development/ screening/ further development, the preferred option
   viii) final development/ qualification/ engineering-review of the preferred fix
   ix) recommendation of the preferred fix to the 'main-program's Project Manager (at a point in the main program where flexibility to implement the fix or reject it still remains)
   x) receiving the 'acceptance and implementation decision' of the PM (to accept the fix and proceed with its implementation - or to reject it outright)

b) Task Leadership retains full accountability via the 'ownership' of the issue by the Task Leader (and the Team). This is *not* 'management by committee' (which often implies that each committee participant sees it as their job to 'ignore what is discussed and then do whatever they want'). It is also *not* 'command-and-control' (which often implies that only the command-person is thinking - or is allowed to)

c) Team Members (in accepting their role) are responsible for providing; i) loyalty-to-the-Task-Leader - and to the task-objectives - and for ii) mutually-supportive-participation throughout

d) Transparency within Team activities is essential – without that there is no way for all to be on the same page – or for b) and c) above to be realized

e) A carefully-structured and highly-detailed 'Agenda' is essential to allow the 'working-chair' to conduct the meeting rigorously – so each issue can come up in turn and be thoughtfully-addressed by whoever is responsible for (and prepared to speak to) that item

f) The Working Chair (who is not necessarily the Task Leader) must do his job – of preparing a workable Agendas – of crisply conducting the meetings – of demanding that all participants come prepared and speak concisely to their issues – and that conclusions/ actions/ findings are appropriately documented

g) Proceedings (good old-fashioned minutes) are essential - without such each person takes away their own (often amazingly diverse) interpretation of what was decided – and every meeting starts over at square-one (since without consistency of attendance and no consensus as to what was previously decided, there can be no define-able 're-starting' point)

h) Task Leadership requires the ability to do 'Strategic Thinking' - Strategic Thinking is what separates successful organizations and governments everywhere from their 'lost-and-wandering' competitors and oppositions. It requires cooperative, mutually-participatory effort

i) Issue-Identification and Issue-Definition are the activities for any project which first of all '… find out what needs attention' and then '… lays out the requirements, success-parameters, work-scopes, review and approval process and the schedule and budget parameters' for the opportunity at hand see Section 5 of the paper. See Section 5 of the paper

j) Task Leadership in the end is just 'Plain Old Leadership' – as defined by two people who have built incredible personal and business success on their leadership capabilities;
   - GG David Johnston, then U Waterloo President - famous for espousing '… the spirit of barn-building' – who defined leadership as - '*… realizing total dependence on those around you'*
   - Bay Canada President, Bonnie Brooks – '*… being able to paint the picture of the castle in the sky which does not yet exist – and from then on it's "… mind on – … hands off" '*

2. Conceptual Design

While everyone these days says they do design, the reality is that almost no-one can actually do conceptual-design or design-for-function. Slapping on more junk (plate/ welds/ more-plate/ rigidity-whether-it-is-needed-or-not) - then endlessly re-running big computer models until areas of over-stress eventually disappear is definitely *not* design. Such an approach does guarantee incredible-and-costly-complexity, tedious-manufacture, high-cost, and all that goes with it.

Note that there is a time and place for everything. Conceptual design must be done at the front-end of a side-stream issue-definition and resolution process – and as a side-stream activity be complete-able at a point where its implementation will not delay or unnecessarily-disrupt the base program. Having developed the new design and completed the necessary shake-downs, reviews, and 'option-acceptance-for-implementation', it must then be subjected to the necessary configuration-management/ documentation/ process-control that is necessary for its adoption and rigorous implementation within the base program

A few of the essential skills for Conceptual Design are;

a) 'Cerebral Design-Concept Development' capability is essential - everything truly new starts in the brain

b) Conceptual Design and Design-for-Function capability – 'design-integration' and 'slapping-on-more-junk' methods are not conceptual design

c) You need to use 'basic-principles' methods during design optimization or problem-scoping. Without that you have no idea what you are really doing, you take too long to get the answer, it is so opaque and so inflexible as to totally immobilize any thought of design optimization, let alone a break-through

d) During any design or analysis task you need to use at least one or two different 'manual/ reviewable-from-basic-principles' 'design-performance estimating-methods' - in *addition* to the 'big/ guzzilion-element/ multi-month/ formal-qualification finite-element' method. I.e. – without such cross-checking of methods you have no idea as to whether your 'first-digit' means anything, let alone the other 15

e) 'One-Figure-of-Accuracy Estimating' preferably in the head, is an Essential Concept-Development Tool

f) *Pencil and paper* for sketching and *real drawings* to show details of the evolving configuration (and to allow discussion by all involved) are essential – i.e. - computer-work by a single modeler (who is likely to be the only person who has any idea as to what the design consists of at any point in time) and endless hand-waving over 'presentations' are *just not good enough*

g) The designer must also have the ability after '… giving it his best shot' of putting the design in front of an engaged and mutually-supportive team for some input/ mentoring/ criticism/ and the occasional break-through idea – refusal to do such is just not acceptable to any program

3. Planning-Planning-Planning

The key to grappling with work-orchestration for those enormously-complex outage-turnaround and refurbishment programs, let alone new-build is, as was made very clear during utility-executive-level consultations prior to CMC 2011, 'planning-planning-planning'. A few important tools for such work are as follows;

a) The first thing that is needed is a determination to bring the orchestration of all work and activities under a crisp, appropriately-definitive plan prior to proceeding

b) CPM (Critical-Path Method) Issue-Resolution Planning – an essential Issue-Definition and Task-Planning tool

c) FMEA (Failure Modes and Effects Analysis) Process Verification – essential to verify before the fact that the process at hand can and will work as expected

d) An 'Independent Manufacturing-Process/ Engineering Audit-Service Capability'- that '… *The Guarantors Can Take to the Bank*')