

<b>MFI – Interview Summary</b>		
<b>Date:</b>	May 11, 2018	
<b>Location:</b>	Grant Thornton LLP – Boardroom – 15 International Place, St. John’s NL	
<b>Attendees:</b>	David Malamed (Interviewer) Scott Shaffer (Interviewer) Angie Brown (Note taker)	Jason Kean (Interviewee) Deborah Hutchings (Legal Counsel – Benson Buffett)

This document contains summary notes of the interview held with the above noted attendees. These summary notes are not intended to be an official transcript of the interview. These notes were based on the taped recording of the interview. These notes are for discussion purposes only and should be shared only with the interviewee and his/her legal counsel. The purpose of these notes is to determine if the interviewee believes any responses are factually incorrect based on the interviewee’s recollection of the interview. Based on feedback from the interviewee revisions will be made if determined necessary.

Date of summary: May 25, 2018

Note: Bolded items represent questions asked by Grant Thornton LLP with the interviewee’s response immediately following in point form. Where the response was provided by legal counsel it has been noted.

- **Start at 9:00 am**
- **Can you tell me a bit more about what your role was with Nalcor?**
  - Yes – I have my CV here and I can provide you with that
  - I was made aware that you were interested in speaking with me about the sanction cost base and what happened after sanction
  - What I have done is put together a slide deck for that. I can present electronically or by slides.
- *Legal Counsel – I have been advised that I can give the documents to you through David Howe. I will send those to David Howe.*
- **Jason provided paper copies of CV and the slide deck to Grant Thornton**
  - This shows my participation in the project.
  - This is the current CV that I present to various individuals and a synopsis of who I am
  - I’m a professional engineer
  - Graduate of MUN 1998 – degree co-op program mechanical engineer
  - Did an MBA at MUN and graduated in 2010
  - I have a project management professional designation
  - I have been involved in mega projects since graduation in about \$20B worth of projects always on behalf of the owner
  - Spent most of my career with Petro Canada during the building phase for the east coast developments – Terra Nova \$2.9B development 1997-2001

- In about 2000 I became involved in the front end phase of Hebron development
- I was involved there as Petro Canada was a joint venture partner with 24% interest
- Involved in concept selection for floating platform and gravity based
- Worked with the partners there and a lot of the international contractors
- Involved in the White Rose concept selection for that oil field development and a lot of deep water prospects
- Unique experience early in my career that gave me a lot of board room table experience on big issues
- Always dealing with \$100M dollar issues – you need to appreciate where every dollar goes
- In 2002 Petro Canada representative on the White Rose Project 27% ownership in that project
- After that I had an opportunity to go to Western Canada on the Fort Hills project
- I decided to pursue opportunities here
- Joined NL Hydro in 2007 on Lower Churchill Project in the planning stages
- I left in January of 2017
- I've interfaced at the VP and C-suite level
- Been a consultant for Nalcor since then
- I've written a number of papers
- Received top awards for papers on governance, transmission line planning - part time enjoyment of mine
- Since departing Nalcor on a full time basis I have had some consulting assignments in the last 15 months for Emera Energy and Westney Consulting, and on an international LNG project
- The rest of my CV gives details on my experiences therein and my accomplishments in these roles
- Meant to be fulsome and to provide summary of what I have done throughout the time I was there
- Now I am consulting for one of the largest integrated oil companies
- Very good career and very rewarding
- **I can see both teaching and learning from your CV?**
  - Yes
- **Your publications? AAEC – is that where it was published?**
  - Accepted as a publication for an AAEC conference
  - Published in the proceedings
  - I have to present it
  - Approved for inclusion in end of June
- **Would you like to do the presentation first or for us to ask questions?**
  - I think you will see things in the presentation that you would not have seen anywhere else
- **Jason refers to the hardcopy presentation slide deck**
  - There is so much information out there, I want to give you a glimpse into some of the areas
  - You may have seen some before or it might show other areas you want to dig into
  - This is my personal presentation to you and my first-hand knowledge of the Muskrat Falls project
  - The extent of my analysis of post sanction events is limited consultants access to information since I left in January 2017

- I make no claim to the accuracy of these claims – just my professional views
- There are few with the breadth of knowledge of that project and organization that I would have
- Objective – accurate and relevant information and insight
- Again its presented with knowledge that few individuals would hold
- I wish to demonstrate a willingness to support the Commission’s mandate
- There are a lot of myths out there but there are some very core facts that need to be appreciated
- Four items I would like to talk to you about
- 1 - my role and clarity on why I left
- 2 – context regarding project governance and how it was planned and management decision making
- 3 – sanction cost and decision basis and input to DG3 or sanction decisions
- 4 – post sanction turbulence that led to cost growth
- There are a lot of complicating factors that I have thought extensively about over the years
- My participation in the project was very rewarding – it spanned ten years and I wouldn’t change it. It was a once in a life time opportunity for someone who wishes to build great things
- Myriad with a lot of controversy – it is a great project and I am very proud of my contribution.
- My participation was fostered by my passion to contribute to Newfoundland and the provinces energy future
- I am a passionate Newfoundlander
- My time with Petro Canada wasn’t just building mega projects it was being involved in the front end of the development of the projects, making decisions and developing strategies that would maximize the opportunities in Newfoundland and Labrador
- It was important to me to try and make a difference – good legacy for future generations. I believe the Muskrat Falls and Lower Churchill Project sets in motion the next evolution of the energy prospects of Newfoundland and Labrador for the future.
- We have been myriad by a legacy of resource give away
- None greater than the Upper Churchill arrangements
- I’m not affiliated with any political party – just a patriotic Newfoundlander trying to do what’s best for the province
- Lots of people thought we were fools for leaving an oil company to go work on this project
- I held a variety of roles there – initially project services manager – established key strategies
- With a collective team – no one person does anything
- Following the award of SNC post DG 2 – I was Deputy General Project Manager
- Held that position through to my departure
- Stepped in and became the senior project manager for transmission line construction
- I contributed to the project from early business opportunity to greater than 60% complete – despite challenges
- Great safety culture – 30M hours with an injury rate of 0.65 which is leading edge in NL from a safety perspective
- LCMC – created as an entity – best in class Independent Project Analysis recognition
- 525 person in that organization spread through the entire spectrum of services

- Led the build of the single largest transmission line in the last 20 years in North America –from late engineering to 75% construction complete when I left
- Architect for a portion of the government structure and management processes
- Did a lot of grunt work to get from EPCM to integrated project delivery team – that was hell on earth but if we didn't do it we wouldn't be where we are today
- Why I left?
  - I made a values based decision – I'm a values ingrained individual
  - In 2013 I personally put a lot of focus on Nalcor's values in how we ran the organization
  - We were moved from an EPCM model to an integrated team
  - No matter who you were you were treated the same, acted the same etc.
  - The values that we had was what we were all about
  - I saw an opportunity to roll that out more aggressively.
  - Sent an email to align the team values with the corporate values. Ask ourselves: Are my actions consistent with these values? Am I conducting myself with business activities consistent to the values?
  - People will hold you accountable for these things
  - We took this to a level that everyone would have Nalcor value cards
  - Toolbox talk with people and put stickers on their hats. This is what we expect our contractors to adhere to
  - A lot changed in 2016 – there was new leadership - bifurcation of the project occurred and there was Executive VP Power development and an Executive VP of Power Supply
  - I reported to the executive VP of power supply, John MacIsaac – John didn't believe in these values
  - He would tear the posters off the walls
  - There was an ideological rift between you and your leadership
  - I spent 6 months trying to keep operating and wished to be treated in accordance to these values
  - When you are being undermined and put in a box and so on – you really have to look hard
  - Over Christmas 2016 I came to terms with the fact that I couldn't continue. Resigned on Jan 4, 2017.
  - One of the hardest decisions I have ever had to make
  - It was for the best.
  - I didn't want to work under someone's thumb or to be manipulated. My contractors saw they could do the go around and the contractors would then state things about not being treated fairly.
  - There was a desire to get things done. We moved from a cost driven project to a schedule driven project – no matter what the cost, let's get this done.
  - They threw money at contractors just to solve issues – there is plenty of documentation on these things but it wasn't my ideology
  - I presented viewpoints particularly with Valard – they did very well on that
  - It wasn't Nalcor initiated – I was pressured – I was pushed into the corner and I didn't have a lot of options if I wanted to look myself in the mirror
  - So I decided to move on
  - I gave my 30 day notice on January 4<sup>th</sup> and I was told I couldn't come back to the office anymore - to stay home.
  - I was asked to write a report outlining all of the commercial issues with Valard who was the transmission line contractor
  - I prepared that and submitted it to Nalcor legal counsel on the 10<sup>th</sup> of January – at that point my email access was gone
- **Who told you that you couldn't come in anymore?**
  - HR – that's not an atypical protocol – I understand that
  - I did have my email for a few days which enabled me to send a nice farewell email
  - It was a great ride
  - In 2017 summer – Muskrat Falls team reached out to me for some cold eyes support on the Andritz file and I gave them some support in the fall
  - They have goodwill
  - I'm engaged as a consultant

- Difficult decision – but it was the right one.
- Project governance
  - A number of us had been involved in a lot of mega projects with oil and gas. We were exposed to a lot of best practices.
  - Lessons learned from the projects that don't go right
  - We wanted to make sure we did this right
  - Yeah a little bit by textbook – but also practical because when you are dealing with IPA's there is learnings from those
  - We used to follow the stage gate model
  - At the CEO level – Ed Martin, who I worked with previously at Petro Canada. He was the manager of joint ventures there. I reported to him
  - He had exceptional leadership and he was the biggest champion of the values and introduced me to Stephen Covey and the 7 principles of highly effective people
  - We wanted the best of the best, sought out expertise, learnings from other projects, expert consultants – we did a lot of front end loading and that was confirmed by IPA
  - IPA 2008 – pacesetter review
  - IPA 2010 – pacesetter review
  - We received great marks
  - There would be gap closure plans developed
  - We had a lot of folks on risk identification – before me I believe
  - 2006 they were doing risk work
  - I took it to another level – RFP in 2007 – we engaged Westney Consulting
  - I do work for Westney today
  - I had followed some of Dick Westney's work in the 1990's – during my time at Petro Canada
  - They focused on big ticket items
  - Not getting down to all the little risks that could cause problems, but it's the handful of risks that could really impact the project – lets focus on those
  - We call those our key risk areas
  - They were primarily strategic risks
  - We collected a lot of lessons learned and intelligence from Icelanders, various utilities across Canada, mining companies, oil and gas to try and bring together the best model
  - At that time we were intending to be non-recourse project finance, no government of Canada guarantee- it was identified as a potential opportunity
  - PricewaterhouseCoopers – London – gave a lot of advice for project risk execution strategies including risk transfer. Advised big packages to transfer risks.
  - Others can explain the financing and contracting strategy with more subject matter expertise than myself
  - In 2008 we put together a risk allocation philosophy – the Deputy Minister of Finance used to come to our risk workshops and our finance meetings
  - They were engaged
  - In order to complete the project – we had to allocate the risk. There was no one party who could take all of that risk
  - At this point we were looking at Gull Island following with Muskrat Falls
  - Gull Island was focused on shipping power through Quebec though the open access as well as a DC link into the island and on to Nova Scotia
  - Three times the energy capacity of MF
  - The plan was to start Muskrat three years after the start of Gull Island
  - Province had done a new deal with Canada regarding the offshore Atlantic accord – royalties were good
  - Province oil revenues were \$2B – the balance sheet was quite strong for the province
  - In order to support - to try and channel non-renewable revenue into these renewable energies was strong so the province issued this energy plan
  - In order to develop the project we need to be able to look holistically at the risk that it had, the construction costs, the risk to the rate payer, finance costs, market risk if you couldn't move power through Quebec, the

strength of the off takers there was a whole myriad of activities that needed to be done in terms of corporate structure

- Done very systematically and strategically
  - A working group of a lot of senior people
  - Included representatives of Nalcor/NL Hydro at that point and the province.
  - Recognized that SOBI crossing was a \$500M risk
  - We did a full review of tunnel vs sea bed. 2010 sea bed option was selected
  - DG 2 risk analysis report shows the big risks that were originally identified.
  - Focus on off take and allocated risk to the right party but with a balance on cost
  - Project planning was aided by strategic project planning framework
  - As we shifted to Muskrat Falls in 2010 period everything is very logically and very well documented – project charter, what our vision is, business goals, execution plans, contracting strategies, lessons learned reviews and so on
  - Eventually are management plans that are used by our organization to manage various aspects of that
  - Supporting management plans are various processes and procedures on how to procure a contract, issue a contract, issue a change order, prepare a role description
  - 100s of documents supporting the project
  - We did follow the project contracting process – with many checkpoints requiring multi party endorsements
  - What are the unique attributes and unique challenges
  - What potential players are out there
  - What kind of margins are contractors asking
  - Then we get into screening and selection
  - What is the best delivery option for us
  - If we were going non-recourse financing we couldn't go with local contractors that didn't have a balance sheet that was bankable
  - Develop a contracting plan from that
  - When you do your expression of interest and so on – as a result it will lead us into a model we can execute
  - I'm sure that the Lower Churchill supply chain group will show you contracts, various prequalification documents (expression of interest and bid lists) that flow out of these things. This shows the overarching contracting strategy of the project which is a written document that exists
  - That is a very important document – shows how the project was conceived and how the project was developed
  - I personally took the pen to that document
  - Basically following this model
- **Slide 12 now going to slide 13**
    - The application for that process allowed us to make certain decisions – to have a EPCM model and used the strategic objectives to select an EPCM model and to design the packages
    - Laid out all the packages such as supply of transmission towers, clearing of right of way by a contractor
    - Overarching contracting strategy speaks to this in a lot of detail – dated 2010
    - Slide 14 – then takes it to a point of having clarity on contracting strategy layout the organizational responsibilities with the selected execution approach.
    - When you understand your roles and responsibilities are you have to have the tools in place to be able to meld with those roles in place – software tools, iPad, etc.
    - There are three basic sub projects under Muskrat Falls
      - Labrador Island Transmission Link
      - Labrador transmission assets
      - Muskrat Falls Generation
    - Each of those have some common elements. They were grouped together as execution components
    - We use the term components for the grouping of work

- If you are wondering what Component 2 is– because you don't see it referenced, that was Gull Island generation
- Well documented project governance and management system
- This is an extract from a diagram that I prepared in the project execution plan B1 (subsequently revised a couple of times)
- Pyramidal type approach
- Project governance plan that documents the relationship between Nalcor and the project - talks about gateway processes – flows down to project charter – project execution plan and supported then by management plans
- Far left is environmental management plan and in some cases there are sub plans and supporting forms
- Without getting into a lot of details the project execution plan
- Everything is intended to be linked together in a logical format
- Everyone had copies of the booklets
- Example of some of the processes for the case of the transmission lines – overland transmission plan for the construction phase, quality surveillance plan, inspector handbook, completion plan, and forms beneath these that get populated and put in the system
- We wanted a high performing organization which we had
- Governance mechanism includes clearly documented decision authority
- Decisions on financial authority, hiring, project changes, utilization of contingency, the approval of cost forecasts
- Strong governance included strong decision making clarity
- That was the objective, and that's what we put in place
- Likewise the team practiced quality decision making ensuring adherence to structured decision analysis process
- Projects are about decisions - no decision is basically a decision
- This follows a work flow
- This is the way our management change process is mirrored
- Management change records – you will see how that was followed
- Slide 19 best in class governance and controls and they were overseen by Nalcor corporate
- Management system and controls were at the base
- Various assurances were done - internal Nalcor quality checks, corporate audit function with imbedded audit staff – led by Jackie Borden Nalcor Corporate Auditor
- Corporate auditor – Deloitte
- Government Canada – reports
- Oversight Committee – reports
- We had that many reports that we had one person just writing reports
- Stewardship Reporting Coordinator
- Slide 20 - Timeline
- There are so many reviews done over time
  - Nalcor led – light blue dots

- Government NL initiated or led – dark blue
- Oversight Committee – green
- Government of Canada - Independent Engineer – orange
- There was reviews by many entities
- This is excluding Lance who would come in to do a review ice loading on transmission line or Cathy Jones from the US army core of engineers who was brought in as a technical expert
- That was separate – this is just entities such as EY, Navigant, IPA – doesn't include Westney or these types of people
- There was always someone coming through the doors
- There were some good findings but there were no great revelations in any of them – everyone had to earn their pay
- It was good validation
- Made you feel good when there were no great findings to reaffirm that we were doing something right
- Slide 21 – I can continue or we can ask questions.
- **Interview took a short break**
- Section 3 – which is the sanction cost on a schedule basis
- Estimates to support the sanction
- I don't really know what documents you have received
- The DG3 cost and schedule is well documented
- Why is my name on a lot of these documents?
- I was the proficient writer in the organization so I would consolidate some of these things into one readable document
- Basis of estimate document – that talks about how the estimate was prepared
- Capital cost estimate – summary report of estimate appended which included 30 binders of workings by SNC Lavalin
- Report talks about how all of that comes together to create the estimate that was prepared
- Escalation report on the right is a report standalone document basis of how escalation for the project was prepared
- To the left of that is DG 3 project cost and schedule risk analysis – summarize the entire risk process for DG3 including the risk workshops
- **Far left hand – where the signature is, is who prepared it?**
- Yes prepared by
- I prepared this document using SNC documentation
- I was responsible for the overall estimate plan itself
- SNC role and responsibly was in an exhibit to the EPCM agreement
- I kept very tight constraints on that because of the criticality of the estimate – we wanted to understand what was on the estimate because we needed to condition it as part of the risk analysis
- You are doing engineering and various cuts would go to estimators with design
- Some areas of the projects didn't have as much design definition – including the DC transmission line



- We didn't have any geotechnical data because we weren't allowed under the environmental assessment process – had to fly in a mini Kubota excavator on a helicopter to dig down 1 meter in a few locations because it would mean we would start construction if we entered into all these remote locations
- That was challenging from an estimating perspective – we had to make assumptions based on mapping and geotechnical data
- We had different firms do a review for us Stantec, etc.
- Various off ramps
- You get a confirmation engineering level later on down the road
- Labour costs – you are negotiating effective agreements along the way – what's going to be the basis of our labour costs, commodities, etc.
- Summary level report for Government Canada – a higher level synopsis, 50 odd pages
- 2013 – integrated project schedule formulated from the project control schedule used to align the build sequence and the estimating duration with build sequence for the project – very critical
- Target milestone schedule – which were the dates we were asked to meet
- They are target dates
- **Who set those dates?**
  - First when I was engaged in 2007 the desire was to have power flowing from Churchill river in 2014
  - Various things with aboriginal negotiations on land claims, IPAs, Upper Churchill redress, and the environmental assessment process expanded generation from 28 to 54 months
  - 2014 became 2015, 2015 became 2016, Gull became Muskrat Falls
  - Muskrat Falls was June 2017
  - As we moved toward sanction and sanction got delayed. There was no appetite to allow the target to slip any further than 2017 at a shareholder level.
- **You mean a government level?**
  - Yes – when I say shareholder I mean the province of Newfoundland and Labrador
  - Active shareholder in this project – sometimes too active
  - Back in the early phase - the shareholder had to be involved to bring this monumental project owned by the Crown to the front – to be developed. They were involved in various aspects
- **Why December 2017? Why was that the date?**
  - If everything went as planned it was viable
  - It wasn't just something that was pulled out by the premier or anything like that
  - It would have been based on our project control schedule, and our planner said if the build sequence goes like this and we get various other things done we can get it done by this date
  - So people said ok let's do that
  - I'll explain the risk conditioned view
  - The DG3 cost estimate was based on DG 2 estimate and established the basis for project control
  - The accuracy of the estimate is a function of the amount of data we had to go into it, and the amount of risk we see
  - It was targeted to be an AACE class 3 estimate – at the time there was no AACE for hydro projects that came along after. Written by John Holloman

- **Jason shows a copy of John Holloman's publication**

- Included all the detailed quantities and geotechnical analysis that came out of the river drilling, included all the bid costs that we could get, the marketing intelligence
- What labour rates we had from the collective agreement
- Prepared in 2011 and locked down officially in April 2012 and fed to investment evaluation in a cash and cost flow format – to mirror the target schedule
- A class 2 estimate was planned to be presented at financial close – would include the material contracts – the top ten
- Of course we would have had contracts for 80% - October 2013
- Slide 24 builds on that
- Consistent with industry standard – estimate is as good as the information you have
- You have to cut off on the amount of engineering – you can't keep spending oodles of money on front end loading before sanction
- IPA said 4-6% of capital on FEL
- We were in that sweet spot
- Navigant said we were doing a great job from a risk perspective and we factored that in
- But the core message here is that the accuracy of the estimate improves in time
- We had three shadow credit reviews done on this project - Moody's, DBRS –I don't remember the other but finance group can provide insight on that
- We would have bids in hand – fixed and firm prices
- Fixed unit price – we are going to pour so many cubic meters of concrete and unit prices. We have good clarity on the cubic meters of concrete and have good clarity on unit cost so matter of multiplication
- Services and other non-fixed unit price
- Such as road maintenance, camp maintenance, etc.
- Some quantity or unit price exposure – transmission foundation by type, vegetation clearing, time risk exposure
- It could take longer amount of time to construct than we anticipated so there could be some cost exposure with Nalcor
- As bids came in we would have had market driven exposure
- For context this was 2013-2014 a lot was changing then
- Oil prices were hot
- We had Long Harbour, Hebron and Alberta was gone gangbuster
- The market driven exposure, we characterized that– I will be honest with you, it's much bigger than anyone envisioned
- Equivalent to class 2 estimate but we would have still had market exposure we don't know what that is but we believe we will be in the spectrum of the accuracy of what we've always presented
- Slide 25 – we adopted a cost estimating nomenclature with the estimate broken into four buckets
  - 1) Base estimate – quantity, scope, prices etc. a big arithmetic game which I will show you in a moment
  - 2) Contingency – uncertainty within the project scope from maturing of the cost and schedule – tactical risk or things in the project team control. Didn't include things outside of our control. Included quantity, team

members to manage contractor, basic risks that were understood, typical of estimate contingency. Strategic risk or background risk. Competition for resources, the macroeconomic influence on oil prices were there regulatory issues such as the delay in the environmental assessment and broader governance issues particular to a project being implemented by the crown corporation

- Because you are an entity of a crown you may have consultation issues for example with an aboriginal group that are in the jurisdiction of the project but if the province doesn't recognize them and you are a member of the crown your ability to speak to these groups becomes a heated debate - a turf war
  - If you are a typical private developer you do what you need to do ethically and morally – in a good business sense to your shareholders
  - Risk management plan speaks to governance in general
  - Escalation allowance which includes inflation but could be the supply of aluminium, or turbine generators, will there be price fixing? We incorporate all that into our escalation cost.
  - Strategic risk exposure was always known – when we were in Gull Island there was \$2.5B presented by Westney - Muskrat Falls was deemed to be much less
  - That was management reserve – not project team, it sits with the shareholder – there I saw a commitment letter from the premier on contingency equity – Premier Dunderdale
  - Our job as a project team is to identify and advise that there is risk
  - Then the decision makers decide how to cover that risk
  - On the estimate itself – prepared by joint team with Nalcor and SNC
  - **SNC responsible for 70% of estimate inputs**
  - I have a copy of the base of estimate – page 31, 32 and 33 it was a segregation of responsibilities between Nalcor and SNC
  - SNC was engaged to provide that support – they had the expertise
  - We had a big team – most in St John's office
  - There was a dozen or more estimators
  - Done over a year process with various input from engineering progressively
  - Frozen in April 30<sup>th</sup> 2012 for input to Nalcor investment evaluation in June 2012
  - Leveraged historical information from Manitoba Hydro, Hydro Quebec, Ontario Hydro, production rates and so on
  - Very detailed – tens of thousands of line items
  - This chart I put together at one point to give people clarity
- **On slide 28**
    - Four major inputs
      - What we are building
      - How it would be built – methodology and timeline factors
      - Price factors – unit cost
      - Performance factors – time to complete each
    - All comes together to form the estimate in a logical structure
    - Documented in a base estimate and we look at where things could be sourced from to get viewpoints on foreign currency and we even do things like trade demands to figure out how many carpenters we may need
    - Extensive process to get you to the end result
    - Base of estimate speaks to all the individual things
  - **Document signed May 22, 2013 – DG Basis of Estimate LPC-PT-ED-0000-EP-ES-0001-01**
    - A lot of data put together in a methodical approach
    - We had specialist estimators
    - My knowledge was how to bring together the pieces - process
    - On the escalation front we had third party knowledge from Power Advocate, Validation Estimating, Global Insight

- We follow AACE 58-R-10
- Slide 29
- A lot about taking the base estimate and breaking it into commodities, cost flowing it, using appropriate indices
- Some are general such as diesel fuel and applying the market indices per year over the cost flow to come up with an escalation allowance
- Documented in the DG 3 capital cost escalation report
- Extensive estimate assurance – we had check estimators
- They were given some information and sent to do a cold eyes estimate of that
- Things like transmission line or foundation construction
- A lot of data gathered for market intelligence facilitated by supply chain
- Custom escalation indices for specialized equipment prepared for power advocate
- I had an estimate preparation check prepared by John Holloman – author of a number of recommended reports from AACE
- He came up with some findings but he states the LCP gate 3 estimate in its current state is one of the best mega project estimates that he’s seen in some time
- Coming from John Holloman that is pretty important for me personally
- John published this book
- **“Project Risk Quantification” John K Holloman – copyright 2016**
- Slide 31 – we used Westney to conduct quantitative risk analysis
- They brought their Risk Resolution –tools etc.
- We used this model – 5 done from 2008-2016 and there was another one done in 2017 after I left
- The same methodology was applied to all of them
- Two differences – estimate outputs were always set at P50 with estimate contingency only
- In 2016 – most of the strategic risk materialized from DG2 2010 to QRA 2016
- In response to EY report we provided an update to the overall risk exposure using Westney
- EY recommended that Nalcor adopt the P75 model and include strategic risk exposure
- **In DG 3 – P50 was used. Who decided that?**
- That was a business decision to align with the inputs
- Investment evaluation process includes numerous inputs – price of energy, spot market pricing, etc.
- My understanding was that all inputs were at a P50 level – this was the input field. A direction we were given
- That’s my understanding
- Leadership was aware of what the curve looked like
- That was spoke of at the PUB review in 2011 – we talked about strategic risk review
- DG2 report 3-600M exposure vis contingency equity
- Who’s decision – Nalcor executive and shareholder
- **Would it be Ed martin?**
- Ed Martin CEO, the executive group, shareholder

- I don't know how Mr Martin interfaced with the shareholder
- **You weren't privy to anyone dictating that a P50 was to be used?**
- No
- It's just what we agreed to utilize
- I would have shown the curve shape so that people would understand
- We used the same process in 2016 but a much more conservative approach was taken in terms of P75
- Slide 32 and 33 are slides from DG 3 risk analysis prepared by Westney – strategic risk exposure
- Identified that there was costs and schedule exposure due to strategic risks
- Westney's view was that the scope of the project used for estimating represents design development and information availability consistent with the requirements for project sanction estimate
- They also say that calculating 6.7% contingency is appropriate for the estimating information however, there is a potential time or schedule risk exposure due to weather, and the volume of work
- Aggressive schedule performance of the powerhouse concrete and a few sections of the transmission line are challenging
- The performance rates estimating norms or productivity used in the estimate including the contingency are significantly better than the worst case currently being experienced in Canada – some of which are in NL
- Experienced front line supervision a key to performance and is now in high demand
- This is in 2010 – 2013 oil peak
- Productivity were based upon those coming from Quebec with some east coast adjustments
- Westney go on to say the current estimate is based on the rates agreed for the Hebron project. Proposed rates are lower but have larger union benefits than most of Canada resulting in lower take home amounts
- Attracting labour was never an issue on the project
- Some challenges with Astaldi in getting the right labour – because of the focus of getting local labour
- Particularly in Labrador – they didn't have the experience we needed
- That exposure was understood to be covered by shareholders commitment contingent equity
- DG3 estimate quantified the contingency
- \$6.2B was base estimate, contingency, escalation allowance – that number was public
- On top of that there was contingent management reserve took you to 7.5B – documented in DG 3 risk report
- These are 2012 dollars
- On slide 34
- The DG3 QRA confirmed low probability of achieving our schedule - there was a 1% chance of getting that
- My recollection was that the cost had increased from \$5B at DG 2 to \$6.2B in DG 3 – shareholder said we had to strive for 2017
- Everyone knew it was challenging
- It was a 21 month incremental schedule exposure between Dec 2017 and when we would expect power to be available
- On slide 35
- Risk analysis results from 2012 with 2013 and 2017 for Muskrat Falls generation only, power house not transmission line

- At sanction target duration was 58 months the P75 was 79 months
- March 2016 QRA – new duration was 60 months and p75 was 79 months
- June 2017 QRA – still showed p75 of 78 months
- People say we lost time
- The analysis at DG3 May 2012 identified that we had a lot of schedule risk – and at P75 it would take an extra 21 months beyond schedule
- The project team identified schedule risk exposure – that was communicated and parties were aware of that
- But in the public eye the project team was a failure
- The records show what was done, what was the basis for that
- That's a fact
- No one had a problem targeting Dec 2017
- When the project was sanctioned the bids weren't in for the main powerhouse
- During the post sanction to financial close there is some adjustment – went from July to December
- Spillway diversion was moved from 2015 to 2016
- Yes it was an aggressive date but was it plausible?
- Mantra was that if you don't set tough targets and strive to get people there from a costing schedule
- That was held by executive and shareholders - we went through a few premiers - people changed and minister of natural resources changed
- I had no problem with targeting the December 2017 schedule
- As long as people realize the risk exposure
- I assume the right people were aware
- We tried our best to do this cost effectively as we can because we are cost driven – want to do the best for the ratepayer
- DG 3 risk assessment included all appendices
- This is the last slide in this section
- **Interview took a short break**
- Start part 4 of the presentation – Slide 36 – post sanction turbulence
- What course of events led to things going to \$10.1B
- This is the most important part of the presentation
- Some analysis that I prepared late last fall for preparation of this type of engagement
- Thoughts of having an inquiry people wanted to know what happened
- I was asked by Nalcor to put together some thoughts
- Why me? Breadth and depth of scope and good at picking out what is relevant and concentrating on the core drivers
- It's important to put things in context
- In the years following sanction Muskrat Falls experienced a significant number of unexpected events - unknown strategic risks each of which had consequences

- Summary timeline of project 2012-2020 green boxes representing years that have passed – dotted line is original base line schedule
- Green line is actual earned progress Muskrat Falls Generation , Labrador Transmission Assets, Labrador Island transmission Link
- Shape of that curve is very important – you can see the departure from the plan initially and then a stronger rebound at the point in time
- Slope of the line is largely the same from Ed Martin to new CEO
- Departure of the CEO in my opinion is irrelevant as there was no change
- Astaldi initially handled the progress
- This is another story that others would like to share with you
- Slope of the curve the year before Ed Martin departed and after was no different
- Stan Marshall might say he turned it around but I would say bullshit – nothing against him
- I have too much into this personally – this is our future
- I want to highlight major events that occurred over time – triggered the project we see today – positive and negative events
- 2012 SNC corruption scandal – that was after our awarded contract. They are a different company today than they were
- Integration occurred shortly thereafter – because of their performance
- April 2013 bids came in
- These are part of a story
- I would emphasize that these are some of the major events that triggered – presented in numerous ways
- Slide 38 – unknown strategic risks – they didn't all transpire concurrently
- Key influencers in cost updates
- On the left side of the curve you see \$7.5B equivalent in dollars spent to the \$10.1B which P75 at sanction including strategic risks
- \$6.2B is the public number
- The growth from \$6.2B to \$10.1B occurred over five successive revisions to AFE
- AFE 1 was 18 months after sanctioning in June 2014 which took us from \$6.2B to just under \$7B
- That's when it was publically made – takes 6 months to a year to bring things to the public
- AFE 2 - \$7.5B announced in 2015
- AFE 3 - \$9.1B June 2016
- AFE 4 - \$9.4B Dec 2016 (final Astaldi agreement)
- AFE 5 - \$10.1B new leadership bifurcation
- **Did you say from AFE 3 to AFE 4 was where the renegotiated contract happened and that's why the jump occurred?**
  - Yeah it was an incremental \$300M for Astaldi – when that was announced I wasn't in the building
  - \$6.2B to \$7.5B was bid from contractors, a lot of market conditions, change in transmission from major power outages in 2014, and productivity was much lower than was planned.
  - Some of the strategic risk exposure was materializing

- We were passing the risk onto bidders – they wanted to be paid for it
- We didn't have the money in contingency – it needed to come out of contingent equity
- We needed money to pay for the risk allocation
- Starting to see the transfer of risk and the cost of that
- There was growing negativity and site protesting
- Site had been shut down for over 60 days due to site protest
- Emergent uncertainty for Astaldi financial strength during that time
- SNC corruption enforced change to an integrated delivery
- The impact of that and disruption cannot be underestimated. To believe that you had the strength of an EPCM who turned out to be a total failure
- You would see the business processes from the mine and metallurgy division or power and the guys say they just use excel and they don't know anything about PM+
- It's unfathomable – I think we interviewed 80 people
- It's unfathomable the failure they were in my opinion
- There are some good people and they are still with us today but there are some not so great people – capability wise
- I haven't prepared a slide on SNC
- Post Sept 2015 – cost increase was largely influenced by the Astaldi settlement
- There were claims on Valard and General Electric after I left
- Impact of Astaldi delay – completion schedule aligned P75 schedule in DG3 – which showed a couple more years of time. There was cost but we didn't have money for it
- Risk identified but never funded
- Government mandated change coming out of the site
- Negativity – contractors not wanting to work with us, contractors seeing opportunity, they will go around you when they see new CEO's show up
- Throw old people under the bus if they appease the new guy and get a couple hundred million dollars
- Slide 39 – The comparable adjusted amount to the \$10.1B today is \$7.5B – that's a net unexpected growth of \$2.6B
- That \$1.3B was risk of project delay up to 21 months but did not include carrying cost of all the people
- Didn't include:
  - The risk of poor performance, productivity
  - The risk of EA delay
  - Long harbour – bid hours increased due to long harbour
  - Astaldi was \$300M over the base estimate – that had to be funded – we used all the contingency to award that. This was related to the risk transfer to them
  - Should have been funded from the \$1.3B that was supposed to be set aside in contingent equity
  - My own view – numbers are subject to thought
  - The \$2.1B was extremely unexpected strategic events above what we would have thought in Westney's May 2012 risk analysis
  - There was no thought of the major power outages occurring – the NL Hydro system being so weak
  - Manitoba Hydro / Navigant / PUB all questioned the reliability of the Labrador Island Transmission Link
  - Debates about CSA standards, wind loading, ice loading



- Had to make changes to the link to make sure we were confident of the design – we had to make changes - no big change
- A few million here and there added up
- We also had the oil price drop – was that a hard impact on the provinces fiscal capacity to meet equity payments
- What happened in the Federal loan guarantee – a provision called COREA
- If the overrun was over \$6.2B the province had to show they could put aside equity
- In hard fiscal times they couldn't put money aside to lock in an escrow account
- AFE updates would only be for known costs, known contracts that came in – not for things in a risk adjusted forecast – that would mean they would have to potentially set aside more money in escrow. This was a Government of Canada decision
- Province and federal agreed they didn't want the risk adjusted forecast – we do as we are instructed
- **The government knew the cost could be 7\$.5B at sanction?**
  - They knew it could be higher
  - I can't speculate if the government knew it could be \$7.5B
  - The government knew there was exposure beyond the \$6.2B
  - That was in the Decision Gate 2 package that went to the shareholder
  - The government committed to fund that from contingent equity
  - I have seen the commitment letter from premier to CEO
  - Everyone was aware that there was exposure – times were good then with oil revenue
  - You have to do the best with what you got
  - \$1B issue – Astaldi failure – black swan event
  - Change in government and support in the project
  - Nalcor CEO Change – different view points
  - SNC – impact of overall performance, distraction of people, reorganize and recruit people
  - Market response to negativity by increasing bids to cover risk
    - Contractors would think I better put money in my pocket – you never know what these guys are going to throw at me. Or is this project going to even happen – so they priced their job accordingly
  - There was a \$0.5B reliability and planning issues
  - Geotechnical conditions – could we have done a better job to understand those – maybe
  - But we were delayed by the environmental assessment which ran 1 year late
  - We lost one critical winter season, had access challenges, labour agreements were more costly
  - We had no initial plans for permanent right away access – had to build that to improve reliability
  - IPA first commitment that was not calculated for the 10, 20, 30% for medical services, camp catering , things like that
  - We had some errors – we weren't perfect
  - Slide 40
  - Unknown strategic risks can be traced to 2014 when strategic risks that were thought to be closed re-emerged

- Turbulence is a term I read and it stuck with me as a mechanical engineer
- Strategic management of large engineering projects, published in 2000 by MIT
- Talks about turbulence weakening governance structures
- Filled with projects like Muskrat Falls, large projects that have extreme situations occur and its outside the management teams ability to control
- Aspect to governance
- Includes the shareholders, support systems, strength, alignment on policy, recognizing the risk and work together to solve these
- That all seemed to weaken with successive premiers, different ministers
- Not pointing to one party
- Strength and unity was not as tight
- When times are tough the strength of these governance systems helps the team manage these issues – this book speaks more eloquently than I can
- The next slide
- The \$2.6B can be linked to turbulence including the organizational governance risk
- Figure I borrowed from the book – changed a little bit
- The circle represents the investment at DG3 the \$7.5B – the circumference represents the risk envelope. Everything inside represents anticipated tactical and strategic risk
- As time goes on some of those risks disappear and some are managed well. Issues transpire as well and the risk envelope increases – new risks are now included
- I don't know what could have been done to be able to factor some of these into the decision making
- Would you go with a P100?
- I don't know
- But it's a way of characterising what happened
- \$6.2B to \$10.1B is \$3.9B and of that \$1.3B was part was P75 at sanction – where did that money go?
- Slide 42
- Pie chart because I want to focus on a couple areas:
  - \$3.9B
  - 30% allocated to Astaldi contract cost
  - 21% to DC line construction
  - The rest is across those other packages
- Astaldi – blue
  - No design change
  - You can go through all the project change documents and everything is in detail
  - Explains where every dollar went – it's a success
  - What we have for Astaldi is a commercial issue
  - We thought they could back stop – measures had to be put in place to complete the project
  - Detailed Astaldi story available - Lance Clarke, Paul Harrington
  - I was focused on the DC transmission
- Slide 43 – DC transmission cost growth \$800M and 900M including AC
  - No one event

- Number of unexpected events to lead to the growth
- That is the red and a couple there in CT319 2%
- **Valard?**
  - Yes
  - And some material package
  - Valard \$2.2B that was \$900M more than what was expected to be - \$1.3B start ended up being \$2.2B
  - There are 7 major causes and plenty sub causes
  - Reliability improvements – change notices
  - Estimate preparation
  - April 2012 – design in DC was minimal
  - We got caught on the geotechnical conditions – they weren't like the desktop studies
  - Challenging conditions
  - Access demands
  - Issues with conductor
  - Built conservative foundation designs
  - We went with higher end low temperature steel
  - There are a few million dollars on each of these
  - Geotechnical conditions – you have foundation types, material shortages, backfill concerns, we had conductor issues that cost over \$60M
  - Compressed schedule because we had lost a year from EA – SNC had late engineering
  - HVAC bid – market conditions revealed that there was only one capable contractor – Valard
  - And there project was done within budget
  - Market place conditions
  - Leadership change and ideology change
  - Desire to finish the line in 2017 and there is a cost
  - Switch from cost driven to schedule driven
  - Desire to just settle things up – that's a study I would encourage you to take
  - All the overland transmission scope went from 1.3B at sanction to 2.2B in AFE rev 5 the 10.1B that equates to the scope
  - Flat lined it along the period AFE held constant and the material events that triggered those cost changes
- **The chart has underlying data – can we have that?**
  - I will speak to that in a minute
- **Thanks**
  - Basically I'm trying to take all the things that happened over the life of that transmission line and identify what are the core events to shape this
  - This is available for other areas from \$6.2B to \$10.1B at a summary level
- **Can we get that as well? – Overall timeline for that as well**

- **Does that mean you have – for each of the pieces of pie**
  - No
  - I'll speak to that in a moment
- *Legal Counsel – we could probably get an enlarged version of the slide*
  - Slide 46 – thank you for giving me the opportunity to tell you my insights
  - Hopefully giving you factual information
  - Full project management team document – the Lower Churchill Management Corporation
- **The PMT did their own analysis?**
  - I did most of it for them
  - It was done in Jan/Feb of this year
- **Who led that?**
  - Me – I did it last fall for 3 weeks or a month
- **Does the report have a name?**
- *Legal Counsel – I don't think so*
  - I don't have the report
  - I am no longer consulting for them
  - I just have my working files
  - Because I have working files I was able to prepare
- *Legal Counsel:*
  - *The project team showed me a five binder set of explanations overview of everything*
  - *We wanted to provide you with the information in the appropriate course but that wouldn't preclude individual interviews- you can ask questions during the presentation*
  - *We thought there were many documents that it would be useful - then zeroing in on some of documents that the project team felt it was necessary for you to know*
  - *We weren't given any positive feeling that that was going to happen - we are still prepared to offer that*
  - *There was no intention to persuade you or distract you from what your job was. We thought it may be very useful and very time efficient orientation for you to tell you what the project was all about*
- **Who would be attending that?**
- *Legal Counsel – Lance Clarke, Ron Power, Paul Harrington, Pat Hussy, those are my people just by coincidence*
  - We want to make sure you speak to the right people – and get everything you need
  - Lance Clarke can take you through a presentation on Astaldi
  - People want the opportunity to provide you their experience and knowledge
  - A lot of people have been beaten up over time – people are there because they want to be patriotic, they want a good outcome. They want things to be factual
  - Sometimes it's easier when you have multiple people
  - I recognize that can be a challenge but it can be useful
- **Has this presentation been given to senior management at Nalcor?**
  - I can't speak to that

- What I do know I helped
- I did the grunt of the work over a month's period to prepare an assessment – as I call it the LCP story.
- It is comprised by 5 binders
- Vol 1 is the timeline – 60 pages of key events
- Vol 2 is the road to sanction
- Vol 3 is sanction
- Vol 4 is the post sanction turbulence
- Vol 5 is about governance and assurance
- *Legal Counsel – these also have reference to documents?*
- When I prepared it was one document with footnotes and others proof and edit
- I delivered what my client asked for – an overview
- A lot is purely my analysis
- **Who asked you to do that?**
- It was a request by Nalcor
- **Who specifically?**
- The project leadership team
- Paul Harrington
- Rationale was taking the time before- so much has transpired over the years, there is a lot of material
- **I'm going to propose this – you are proposing we get together with those 3-4 people**
- *Legal Counsel – yeah I think it's down to 3 or 4, with Jason being the main author and the rest agree with what happened*
- **We sit down and do the presentation get to know what happened here and get to know them**
- **We would not be precluded from having separate interviews?**
- *Legal Counsel :*
  - *Not at all. I noticed you needed guidance on what documents to look at*
  - *This is to give you an overview so you can zero in on the main areas. Then it will be easier to schedule the individual interviews*
  - *This is not intended to taint or fix your impressions because it's all there in the documents anyway. It is a guide to help you.*
- **Interview took a short break**
- **Grant Thornton agrees to have the meeting with the individuals we mentioned before to get the presentations**
- **Pat Hussey, Paul Harrington, Lance Clarke, and possibly Ron Power**
- *Legal Counsel - yes*
- **This would be a presentation that includes 5 binders of documents**
- *Legal Counsel - yes*
- **Would not preclude Grant Thornton from having follow up interviews with individuals or requesting additional documentation**

- *Legal Counsel – I agree with that but I want to clarify that in the Binders are not all documents – probably presentation type slides and so forth and they also have graphs explaining this and that. Documents as an under taking or discovery – you are making a request and we would provide you with a particular document in that presentation. You know after the presentation.*
- **Who is the owner of the binders right now?**
- *Legal Counsel - Paul Harrington, I was provided with a set by Mr. Harrington. That's why I have been pushing to do this*
- There are a couple topics I would encourage them to present on – Astaldi and SNC
- **Probably Astaldi, SNC Lavalin and maybe Valard. If they don't know we could come back to you with questions**
- Sure- there are those that would not want me to speak on anything
- **What is the reason for that?**
- That's just my opinion
- Ideology and different view points
- I have a view on the way Valard went and was treated
- Not the same as others – particularly those at a senior level
- Perhaps it is something we could talk about off the record
- **Interview took a short break**
- **At first we were going to sit down with you and then we weren't going to sit down with you – then we were. What happened?**
- *Legal Counsel:*
  - *Maybe I can deal with that. I think as a result of some feedback with respect to the presentation.*
  - *As a whole there was some query and concern by the group as to an interrogation of witnesses. The media set out a snitch line - a CARE line from you guys and then there was also a perceived inability to prepare*
  - *It's a big project with a lot of documents and things that were covered. I've advised each of them to familiarize themselves with certain areas they could expect to be questioned on*
  - *Jason ended up getting quite sick. It wasn't that he didn't want to. He wanted to – they all want to*
  - *My discussions with Dave Howe and Kate O'Brien were very helpful this week on trying to sort out some issues*
- Very unique process
- **Contingency – I know it was a P50 in DG3 sanctioning package but there is wording in the executive package that says it is a -10/+10 range. When I compare it the AACE standards it says -20/+30. Do you know why?**
- I believe it was -10/+12
- The actual accuracy is determined from the quantitative risk assessment – so P10 P90
- P50 is the mid-point. What percentage is negative to P10 what percentage is positive to get to P90, in our case I thought it was -10/+12
- In the case of the AACE – at the time there was no classification of hydro power but there has been one since
- **On the record that was a very helpful presentation**
- I'm glad I was able to participate

- If you need anything else I will do what I can
- **DG 3 package – Have you seen that?**
- Yes I've seen it
- **I understand that you said the AACE was not prescriptive for Hydro, but that it was adopted and referenced?**
- I don't dispute that
- The statement as written was not 100% accurate – not entirely representative as conditions were
- **What should it have been?**
- I think it was -10% to +12%
- **When I look at a class 3 and adopt it. Would I not take the low low and the high high?**
- No, where you sit in that range is driven by where you sit here and the level of risk
- Only through risk analysis will you know where you sit
- I recognize that it states this accuracy range
- We were on the tighter end of the class 3 accuracy
- **The P50 that Westney did \$5,841 excluding escalation were you referring to the levels of P75 and P25?**
- P90 and P10
- Your questions is answered in those binders because I wrote paragraphs on it
- **Can you explain it to me?**
- In theory your P50 is your mean
- If this was a bell curve, basically what you're saying is accuracy can only be determined statistically
- If its -10 there is a 10% chance on it being less than a P10 and up to a 10% chance in being greater than P90
- The only way to truly understand accuracy of an estimate is to do a risk assessment and understand to what degree your median (P50) – what percent it is from P90 and what percent from P10. I think it's -12/+8
- **If I'm not an engineer and I read this it almost seems to me that I would think the variance/range would be -10/+10**
- I can appreciate that interpretation yes
- **Did anyone ask for an explanation?**
- I did various presentations over time - some years ago
- To explain the estimate of P90, or P50, P75 and how they link together to get a level of confidence
- Came up during PUB review
- This excludes the strategic risk – it was talked about but not published in this
- **Let me show you the Independent Engineer's comments – from his report**
- **Paul was making some changes. The engineer came up with the -20/+30 he said the range was to \$5B to \$8B dollars. Right before sanctioning.**
- Must be the first report
- I don't know where that comes from
- **It came from the class 3 based on the process industry because the one for hydro power came shortly after sanctioning**

- I see what is written there but technically you can only determine class through quantitative risk assessment
- There is no reference in the Westney report to class of estimate – or statement of accuracy
- **Holloman wrote an article in 2007 about Monte Carlo – he is saying there are better approaches**
- He gets into its not Monte Carlo itself, its more parametric estimating
- There was a gentleman with decision sciences and there was a bit of a “Come to Jesus” in AACE between John Holloman and Michael Curran that ran decision sciences
- Assessment of contingency using a risk adjusted techniques – same approach as Westney
- You can’t range an estimate – you do risk simulation and use Monte Carlo simulation techniques
- Just range estimating doesn’t make sense
- Contingency estimating should be used – best practice
- Holloman was one of the authors of the current AACE – its contingency estimating methodology recommended practices
- There are 3 or 4 practices
- **Just so I’m clear when you say contingency you mean tactical risk?**
- Yes
- John doesn’t differentiate between the two
- Westney does from their proprietary techniques that they use for modelling based upon how they see characteristics from the real world interacting with the projects
- **You said Nalcor is a group that does something and not one person. One of the things we are looking at are the inputs into CPW. Would that mean that any of the inputs go through a level of quality control? Or does one person work on one input and that goes in to the system.**
- I know a little bit about investment evaluation
- I can’t speculate to the quality checks
- What I do know if there are plenty of inputs and they would be reviewed/tested
- Load forecast, price of oil
- Cost estimate would have had assurance done during the development
- **You said load forecast?**
- Power/ energy consumption
- **Who quality controls load forecast?**
- That’s not in my area – it’s done by Nalcor
- **In terms of the charter you spoke about – does that speak to quality control?**
- The project charter speaks to quality management in general
- The quality management strategy for the project speaks to quality management when it comes to elements in the project delivery team
- Cost, schedule, safety, quality itself
- **You spoke about safety. There was that number 0.65?**
- All Injury Frequency Rate – calculation of lost time injuries and medical aids per 2,000 working hours
- Industry standard metric



- **Does that mean that there are some injuries?**
  - Yes of course
  - To my understanding up until I left there were 11 lost time incidences and I believe they are all back to work now on the project
- **Since then you don't know?**
  - In conversation I heard they had 6M hours without injury
  - That is best in class
  - Show me a project in Canada
- **How do you think they did that?**
  - We started with a safety plan
  - We engaged Exxon Mobil – who has the world's best safety practice from a mega project development
  - Actually went to Houston and attended a workshop with Exxon – developed a work plan
  - Engaged our contracts and really drove that home
  - Felt leadership care, communicate and coach
  - Workshop sharing learnings
- **It seems it's a new standard. Fantastic. Preparation, calling on experts etc. led to that success?**
  - Committing to it
  - And being relentless – whatever it takes to keep people safe
  - Active leadership and participation by worker
  - That is what drives safety
- **When the project was sanctioned – was there enough due diligence done? Like we spoke about safety?**
  - Yes – we had 1M man hours without LTI before sanction
  - The work with Exxon was done pre sanction
  - Safety management system was in place
  - Had a couple of incidents but overall
- **It sounds like you had the right experience**
  - Yeah – we brought in people that had good experience
  - If you don't have it you get it
- **You mentioned that integrating SNC and Nalcor was hell on earth. Can you tell me what that means?**
  - A lot of unplanned efforts
  - That unplanned effort distracts from your personal life
  - Working 70-80 hours a week – you do what you need to do
  - Personal sacrifice
  - It was my own characterization
  - Everyone at a working level got along well
  - That was my own personal experience – strenuous times

- **When I look at health and safety – we (Nalcor) don't have enough experience so we are going to call on experts outside SNC to help us on this project?**
  - On the overarching contracting strategy it talks about how that was founded
  - When we went down the EPCM model we went for a project support model at the time
  - The market wouldn't support that – there was uncertainty
  - Market felt more comfortable working on the project as an EPCM model or an EP plus CM model
  - We concluded that an EPCM model was best for us
  - Through that process SNC was the preferred contractor
- **When the integration happens it seems they are advisors to Nalcor?**
  - I wouldn't say that
  - They had some financial authority
  - Some of them were managers – the environment was an SNC employee
  - Project controls was an SNC guy
  - Document control lead was SNC people
  - Construction managers were SNC
  - The reality is that SNC has no liability except the engineering design
  - There are things you would expect the engineering contractor to be able to provide to you
  - Core competency – they should be able to determine the key deliverables they need to produce
  - They weren't able to give us a drawings list
  - We hired someone from external – to make them engineering deliverable coordinators
  - We got the D team from these guys
- **There was some correspondence between SNC and Nalcor – them saying they want the contract revised as they are not the EPCM**
  - I remember some of that but I wasn't involved
  - Write the construction management plan, etc.
  - I was into the get work done
  - I would suggest that would be best to have with Steering Committee
  - Lance Clarke, Gilbert Bennet, Paul Harrington
- **In April 2013 SNC writes that report. It is hand delivered to Ed martin. Do you know what report I am referring to? \$2.5B of potential risk in the project. Who in the company was aware of this?**
  - No one that I know of
  - We never saw it
- **Did you hear anything about the report?**
  - No – I heard some notions of something on the go – there were a few sneaky individuals around
  - One of them was the risk co-ordinator - an SNC guy it was Uri but then it became a guy who was in estimating coordination who got promoted to risk coordination - JD Tremblay. Thought he was a good guy
  - JD was managing some of that

- Then came Carlos Fernandez
- Did anyone from Nalcor know it was written and was sitting out there
- Same things that are in that report are in the DG2 and DG3 risk assessment
- **If you had seen that report would that have changed your thoughts?**
- No
- Some of that we couldn't change
- The size of the package couldn't change because we can't get financing
- It did not line up with our principals and philosophies to execute the project
- Those are all the same things that were in the DG3 quantitative risk assessment
- They had over one further year of data available – contracts were closed, bids were received, etc.
- We didn't have that – but there was nothing there risk wise
- There methodology that they used to calculate it – I can't trace the numbers and come up with it
- There are no curves or anything presented
- No ranges
- **You had said everything in the risk register that is in the SNC report is in the DG3 sanction package**
- And in the binders
- Referenced in the 5 binder set
- **You have mapped it?**
- Yes
- **Is some of the content included in there?**
- Yes
- We were using the SNC's tool
- Prior to sanction there were different risk registers
- For SNC we were using the SNC software – if you had the big risk report I would show you the attachments
- A lot of them are the same items
- **How was the best case and worst case numbers determined**
- Quantifying the exposure under each risk element
- What are all the known risks that are associated from all the risk registers
- If the risk were to materialize what is the base case if we were to mitigate it, and what's the worst that can happen
- The notes would support the lows and the highs – what the basis of the numbers are
- **Are there calculations or working papers that would show the calculation to get there?**
- These notes will support the numbers
- **Is this all that there is?**
- There would be correspondence – to give the basis for these numbers
- **There would be no calculations?**

- No
- Same approach through 2016 and 2017
- **The presentation you want to do for us – it is difficult for you to talk about leaving. You said you were cornered? Did you feel you were being forced out?**
- Yes
- Email from myself to Greg Fleming the day I resigned
- Wednesday is the 4<sup>th</sup>
- Jan 2<sup>nd</sup> is Monday a holiday
- Jan 3<sup>rd</sup> I received notice from Greg and I want Pete to be your deputy and then I want Keith to do an overall organization review on your transmission
- I said I don't need Pete I have Kumar as my deputy
- He said it's got to happen – he is not stopping until it happens
- I want Keith to do an organizational review – we will tweak the organization
- If it's my organization I want to be part of the review – he said no I want people to be able to talk freely
- That evening I get a new role description for myself – sorry Pete's role description I think
- All my roles were given to Pete and I was going to be a figure head project manager
- I got an email from John asking for a meeting that day
- On Wednesday morning I wrote an email to Greg explaining you are making me a figure head PM, these things are completely unpalatable – you will receive my notice shortly
- I wrote my notice to send to the VP Gilbert Bennett
- I never heard anything from Greg Flemming after - to this day
- On Jan 10<sup>th</sup> – I did have to deliver a report to Nalcor
- Here is a copy of the email I sent to Greg and I forwarded it to colleagues and HR for awareness
- Basically I was dumbfounded that I have given so much over the years – and now this is done to me especially by Greg Flemming
- He was a co-op with me 20 years ago – I felt stabbed in the back
- I knew I was being marginalized
- I wrote an email and this is what I said
- After nearly 10 years I have decided that I need to bid a farewell
- Honoured to work with you to bring this mega project from concept to a reality to near completion
- Professionally been very rewarding
- Having the opportunity to create and share the LCMC – project delivery organization has been aspiring
- While having the organization with a great safety culture who cares about its people is heart-warming
- As I depart – I am reminded about one of the unique challenges of a mega project. while there large and complex, they are fragile
- Pull together as a team and get this project in line for the well-being of all Newfoundlanders and Labradorean's
- Thanked them for support

- I tried to go out with my head held high
- I got about 200 responses back
- **Just hearing this I feel sad for you. I see the passion you have for Newfoundland and Labrador - home**
- I'm 43 years old
- You spend your career
- When I was 5 years old I wanted to be premier
- You want to do what is good
- NL is a very interesting place
- Cultures run deep and ideology
- I believe in this project
- I believe in the energy plan
- You got to do your part and what's right
- We did what we could with the information we had – I make no apologies
- **We spoke about the idea of a meeting – that Nalcor might not be too happy for you to be at that meeting?**
- Yes
- I don't know
- Perhaps my opinions and thoughts are a bit stronger than others
- I don't mind wearing my heart on my sleeve and I don't mind speaking on the strength of the project and the people
- I won't be bullied
- **You had over 200 emails as a result of your goodbye email. What about the rest of the people? What about Paul?**
- John Maclasac is executive VP, is counterpart to Gilbert – Paul reported to Gilbert
- Before bifurcation: Paul was project director who reported to Ron Power as project manager, Greg Flemming as project manger
- I reported to Ron Power as did most others
- Lance also reported to Paul
- I guess with the bifurcation – those that were on the transmission line we went with John new VP
- He had to make a decision who became the project director
- I spoke highly of Greg – I couldn't see myself sticking around with John
- He reported to John and now is equivalent to Paul Harrington
- I agree with the logic completely to focus
- A matter of how things were done
- It's just a matter of people an approaches
- Bifurcation was probably beneficial strengthen of focus
- The approach of those that led the bifurcation is not the best for the project in my personal opinion

- **Ron hears you are leaving what does he say?**

- Me leaving transpired over 6-8 months
- Not an overnight thing
- We all knew what we were getting into when the new VP came
- When June 2016 I didn't think I would make it to the end of the year
- I had a great team and I needed to protect my team and get this transmission line done
- I needed to get the right of way cleared – I needed to protect my team
- I had to get the QRA done
- I had responsibilities to fulfil for my colleagues
- They knew it had come to that point
- People were sad to see me go
- I left the province for two months then

- **Did you speak to Ron about it 6-8 months before you go?**

- Yes
- I had emails from Paul offering support – said if you can't take the transmission world anymore we will take you in the Muskrat world
- Don't resign your duties in the Muskrat world
- I knew that wouldn't work

- **You couldn't move to the other side?**

- I didn't want to be associated with it
- I didn't want to see someone running the transmission line where my guys and gals were- I would consider that a failure
- It was a difficult decision but it was the right decision
- These projects are bigger than one person
- I did send a big email right before Christmas to remind people that there was not that far to go
- The people could take it the rest of the way – they could handle it
- We spent a lot of time instilling good values with people – hoping they would continue with them after I left
- I ordered 1000 of these knapsacks at one time, asked people how their project was going- gave them a knapsack to wear or give to their kid, and told them to wear it with pride
- I did what I could and it was time to move on so I moved on
- If I had stayed there and kept doing what I thought was right that was not good for the organization – I didn't have that authority
- It needs to go in the direction that was decided and that was not my direction

- **Did Gilbert Bennett have anything to say?**

- No

- **What's your relationship with Gilbert?**

- Good
- We didn't always see eye to eye

- Intelligent man – I have respect for him
- What could he say
- He's the target of the Muskrat Falls inquiry
- He's been in the public
- I haven't seen him since I left
- **Are you seeing anyone since you left?**
  - Yes
  - You don't spend that much time with people – you become close colleagues
  - When you work 70-80 hours a week you don't have a life – the social connection is what I miss the most
  - I do have a lot of communication
  - I would call some random field guy and say hello and say keep doing a good job
  - Make people feel good – that's what you do
  - It's irrelevant if the ideology changes after I leave
  - Cost is over run, schedule is over run but the quality is perfect
- **What about SNC?**
  - Some are friends on LinkedIn
  - Paul Lemay
  - Some are still on the team
- **JD?**
  - I think he got a job closer to home
  - He got divorced and so on
  - I haven't been talking to him
  - I was connected with Normand Bechard
  - He had a different ideology
  - Not a bad man
  - He was a very impressive experience
  - Liked to drink – fun loving guy
  - Good experiences
  - Not sure where his motives were always
  - Not sure why he came to our project
  - He left hydro Quebec and joined SNC for our project – raised a few flags for me
  - He had the adjoining office to mine
  - I think Normand Bechard often complemented me
  - Different ideologies but he respected me – more so than most
  - There is a time and place for someone like Normand
  - I wish him well

- **You said you never saw the report but you said people were being sneaky?**
  - Someone (SNC guy) told me that something was going down with some risk thing
  - There was some meeting
  - Normand was always at something behind the scenes
  - They felt they had entitlement
- **Were they working 80 hour weeks too?**
  - No
  - They had preapproved overtime
  - They were paid hourly
  - You didn't have to worry about certain leadership working 80 hours a week
- **Research – collecting the information – reading leans towards mega projects anything of \$1B**
  - In 1984 dollars
- **90% have over runs**
  - Yes mega projects have challenges
  - They vary across every one
  - It's not like they have the same characteristics
  - I always tell people the devil is in the details – you have to understand what happened
- **Is it fair to say that a lot of the overrun was because of strategic risks?**
  - \$1B for Astaldi – couldn't back stop the exposure – strategic risk for labour availability, unions, non-productive times, weather
  - We did a lot of work early trying to mitigate those things
  - You will see that in the DG 2 and DG 3 risk documents – talk about all the actions that were taken
- **In the end it comes out of the same coffers? Strategic risk was not included that in the 6.2B. Is that normal?**
  - Yes and no
  - Varies by organization
  - Exxon Mobil with portfolio – some project will have problems and some will not so they put an equal amount to every project and draw from it as needed
  - We don't have that luxury
  - It should be funded to find that higher level of confidence
  - A lot of projects don't think about it
- **If you thought about it and quantified it why not include it?**
  - The shareholder and executive
- **So Ed Martin and the province**
  - Yes
- **So the estimate is done by different groups?**
  - Westney did risk work but we all participated



- **Escalation was done by validation estimating?**
  - Inputs only
  - Steve Goulding did it
  - John Holloman – validation estimation, gave us some guidance
  - Global insight
  - The estimate itself was done internally
  - They provided input only
  - Escalation was done internally – report on that
- **Due diligence you guys did – you had looked at other mega projects in Canada. I guess there is a handful of them?**
  - We looked at mega projects in Canada and outside of Canada
  - Grouped by power, mining and oil/gas
  - We would meet with the owners and would share lessons learned
  - Go to Manitoba lessons learned workshop
- **From lessons learned on mega projects – I go back to the range of accuracy? How accurate were they? Were they within 10%**
  - I don't know
  - Some would have been some would have not been
  - My previous mega project was under budget
  - White rose sanctioned at 22.50 came in at 22.46
  - Terra Nova sanctioned at \$1.95B came in at \$2.9B
- **What are the rules of communicating the estimates? Public gets the 6.2B when are you supposed to know that changes?**
  - I don't know
  - The shareholder would decide when the public was aware
  - That could be aware of it for a year before notifying the public
  - I prepared a chart of when briefing was made to Nalcor executive and when public was made aware
  - This is in the report /the 5 binders
- **Let's take an example – you knew it was going to \$7.65B in March public knew 6 months later?**
  - Yes
  - A lot of it was the agreement between the province and the federal loan guarantee
  - They didn't have the money to put it in escrow
  - The province didn't have any money – they were in no rush to tell the public
  - They would run a bigger deficit and it's not politically attractive
- **When Astaldi signed up and you blew through the contingency was there a pause at that point?**
  - The forecast was reviewed
  - Presentations were given and discussions were had

- **Was there pressure to keep the contingency down?**
  - Contingency levels were always at a lower level under the previous administration than it is with this administration
- **You mean Ed Martin**
  - Yes
  - Under Stan it moved from 5% to 15-20%
- **Did you rerun the model?**
  - Detailed monthly cost forecasts relating to trends
  - That is spoken about in the report
- **The big vs little package? You said they wanted to all bundled in to one. Why would they want to do that?**
  - As an example – have you been to Muskrat Falls yet?
- **We are going**
  - Everything is together – spillway, power intake
  - Hydro Quebec approach would have 700-800 staff on site managing the contractors for each of the individual grouper
  - They use local contractors and they have a lot of resources
  - Contractors know they will get the best price because its Hydro Quebec
  - Ideally financiers would want the biggest package to transfer the risk
  - You would get a bid but you would be afraid to open it
  - You have to meet in the middle somewhere
  - That's why all the market risk appetite looks at what we can reasonably do
  - We landed on an optimized packaging strategy
  - Trying to find the right balance of risk and cost
  - Same model as Manitoba Hydro uses
  - If your contractors are fighting you will get change orders – creating more headaches
- **It seems that there is a flip side to this. One big package means something goes wrong with that contractor and everything is delayed – putting all eggs in one basket? But with smaller packages you can rely on multiple contractors.**
  - Yes
  - If you have two or three contractors one could also step in for the other
  - We merged together the DC packages for Valard – one of the most competent contractors
  - They got the job done
- **Was there any analysis done in regards to smaller packages?**
  - Yes
- **You said it was mandated by the lenders?**
  - I would say more strong preference
  - They would prefer to have one large EPC

- There was plenty of work done – studies, workshops, etc.
- **You said you would work with Valard again. How about Astaldi?**
  - The most preeminent contractor in the world – probably Bectel
  - Bectel is doing work for Manitoba Hydro and asked for Astaldi's help two or three times
  - Astaldi's concrete production has probably set records
  - They had problems – once they had the right people they performed
  - In 2015-2016 they were second to none in concrete production
  - They had financial challenges
  - Get the guys to explain to you what happened with Astaldi
  - Not saying I would work with them again
  - Valard are great too but they all have negative sides
- **This is part of the CH0007 board recommendation**
  - My name would be on the cover – my signature
- **Page 7 - Technical strengths and weaknesses summary of short list of bidders. One of the concerns that no longer becomes a concern it seems is that man hours seem low during peaks?**
  - I wasn't part of the bid team
- **Another thing that's crossed out is the ability to hit the ground running given local knowledge**
  - From a methodology perspective those would have been raised by the bid evaluation team and they write up their report. They identify areas they need to focus on. Meeting with bidders for clarification. What I surmise is that was raised a part of the bid submission and then in the bid clarification it was removed.
  - I would suggest that's a good thing to bring up with the dive into Astaldi
- **Interview took a break**
- **How did you prepare for today?**
  - After I understood on Wednesday that you wanted to understand pre-sanction costs and what happened after
  - I sat at my computer and tried to map out something to guide the discussion
- **Did you prepare that presentation over the last two days?**
  - Yes
  - I had some documents on my computer but that's what I do
  - Yesterday morning
- **Did you speak to anyone besides counsel in preparation?**
  - Yes
  - Not in preparation
  - I spoke to some who were going through the uncertainty of the interview process
  - About what it would be and would we get transcripts
  - Westney – came up in conversation as I work with him sometimes
- **Anything I should have asked you that I didn't ask?**
  - No – I think you asked me all the fundamentals

- I'm glad we cleared the air on why I joined and why I left
- The nature of the project
- There are so many things – specifics
- Nothing big comes to mind
- **If needed is it ok for me to reach out again**
- My preference would be to do it in a structured way like this
- I have other commitments if you will
- I'm not on a payroll
- I'm here one more week and then I'm gone the 22<sup>nd</sup> for a couple of weeks and then back for three or four days
- **Stop 1:58pm**