



ESD Newsletter

"Value Through Engineering Leadership and Innovative Solutions"

Volume 2, Issue 1

January 2006

Director's Corner

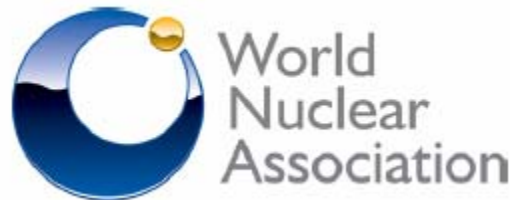
Fred Dermarkar

Director, Engineering Services Division

On January 12, 2006, Pierre Charlebois rolled out the 2006-2010 Nuclear Business Plan to the OPG-N Senior Management Team. Some highlights from his presentation are provided below.

- Total production was up to 44.8 TWh from 42.2 TWh in 2004. At a value of \$49.5M/TWh, this increase in production translates to ~\$130M.
- Forced Loss Rate was down to 5.4% from 7.6% in 2004.
- The Nuclear Performance Index (NPI), which is an integrated WANO measure of safety (conventional and nuclear) and production, increased from 70.7 to 73.5.
- The number of Event Free Day Resets, which is a measure of Human

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Nuclear power plants now the lowest-cost electricity-generating technology.

For more info, see associated article...

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- Dave Austin & Prem Bhatnagar

Performance, decreased from 40 in 2004 to 35.

- Elective maintenance backlog, which is a measure of future reliability, decreased by nearly 40% for Pickering B and Darlington combined.

We should all take pride in this significant improvement in performance relative to 2004.

Looking ahead, the 2006-2010 business plan has some fairly challenging targets for us.

- Production is targeted to be around 50 TWh in each year of the plan, starting with 2006, which represents a 10% increase in production relative to 2005.
- NPI is targeted to increase steadily to 84 by 2009.
- Maintenance backlog is targeted to decrease a further ~60% by 2007 which will bring OPG Nuclear units in line with the top quartile of US Nuclear units.

ESD has an important role in helping the sites achieve these challenging targets and sustaining them. At our "All Hands" Meeting in December, I described the 5 major focus areas for ESD. As a reminder, they are:

1. Alignment with Site needs
2. Managing Design Agencies
3. Value Engineering

4. Knowledge Retention
5. Understanding the Cost / Value equation for ESD work.

I am excited by the progress we have made thus far in these focus areas. For example, in terms of alignment with site needs, for the first time since its inception ESD has a list of ~250 Director Milestones (DMs) which have been reviewed and accepted by the Station Engineering Directors. Developing this list took a great deal of effort on the part of many in ESD, and I would like to acknowledge and thank all those who contributed to its development. This list of DMs will give all strata in ESD a clear focus on what is important and when it is required by, and will ensure that we do not let things important to the sites drop through the cracks. I expect to be using this newsletter to communicate to you how well we are doing at meeting the DMs, and to apprise you of progress in the other focus areas.

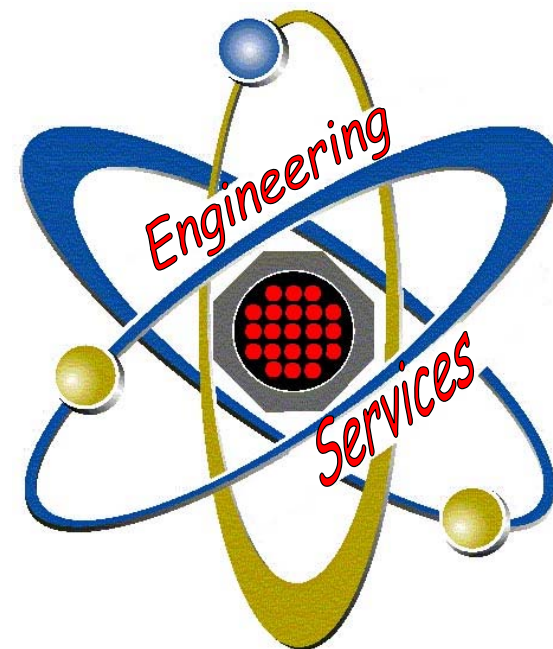
In closing, I would like to express my appreciation to all those in ESD who took the time to complete the 2005 Hewitt survey. I recognize that December was a busy time of year for everyone. However, completing the survey is time well spent: the 2004 survey had a profound impact on the E&M Management Team, and resulted in actions and activities that would otherwise not have occurred. The high response rate we achieved in this most recent survey provides us some assurance that the results are representative of the whole population and gives us confidence that the actions we take in response to the results will be meaningful. **Thank you!!** ❖

ESD Logo Contest

It has been suggested by one of our readers that ESD needs an easily identifiable logo, similar to those of the Stations.

To this end, we are convening a contest to solicit suggestions from ESD members for an ESD Logo. We will give you until the end of February to come up with a suggested logo. After all suggestions are received, a winning design will be selected and the author will be the recipient of a spiffy new ESD Vest.

To get the ball rolling, here is the first submission:



Please send your submissions, or any questions, to the editor:
Mike.adams@opg.com

ESD News

ESD Organizational Announcement

By Fred Dermarkar

I am pleased to announce the following changes to the ESD organization.

Effective Monday Dec 5, **Dave Austin** has taken over the role of Manager - Engineering Mechanics from **Carmina Maruska**. Dave has close to 30 years of experience with Ontario Hydro / OPG involving many different roles which included Engineering, Operations (as a licensed Shift Supervisor), Pickering A Rehab and, most recently, Environment. Dave has a sound and broad knowledge of the nuclear business and strong management skills, assets which will make him an excellent addition to the ESD leadership team. (see also the People Corner)

I would like to take this opportunity to thank **Carmina Maruska** for her capable leadership as the Acting Manager of the Engineering Mechanics Department over most of the past year. Carmina led the department through numerous difficult challenges, sometimes wearing the hat of the Steam Generator Section Manager at the same time as that of the Engineering Mechanics Department Manager. Her commitment, hard work, professionalism and leadership are both acknowledged and much appreciated. Carmina will return to her base role as the Section Manager Steam Generators.

Effective Monday Feb 13, 2006, **Carl Daniel** will take over the role of Manager - Components and Equipment at Pickering A. Carl is currently

the Acting Manager - Projects Design Pickering, and will continue in this role until **Don Williams** returns from the Advanced Operations Overview for Managers (AOOM) course. Although Carl has not yet left ESD, I would like to acknowledge his significant contributions as Manager - Engineering Mechanics in shaping the department since its creation in July 2002. Carl sets and upholds high standards of performance, and leads by example. He has earned the respect of all those who work with him. His move to Pickering A Engineering will round out his understanding of the nuclear business and will be an important step in his career development.



ESD Looking Forward – 2006

The following are brief glimpses from each ESD Manager regarding the challenges ahead for ESD in 2006:

2006 Focus Areas for the Computers and Control Design Department

by Rick Hohendorf

In 2006, the Computers and Control Design Department will continue in its primary function of ensuring the safe and reliable operation of real-time computer systems within the operating island of all three OPG,N generating stations. In addition, we will continue to provide OPG,N leadership in other key areas including Human Factors engineering, real-time software engineering, design basis reconstitution, process control analysis, and tooling for work protection/plant status and reactor inspection. In 2006, there will be increased focus on continuous improvement in areas such as the

value of our engineering services, engineering human performance and sustaining our long-term investment in people and plant. Some of our specific focus areas in 2006 include:

- measuring the health of the real-time software program and identifying any needed changes
- mentoring new staff into increasingly responsible roles
- improving the system health of DCCs by progressing projects already underway and by launching the next phase of those projects needed to mitigate the remaining real-time computer obsolescence threats (Darlington DCCs, Fuel Handling Computers and Shutdown System Computers, and Pickering A PACE)
- issuing the remaining design basis documents for the safe operating envelope systems at Pickering A and putting in place measures to sustain usage of this type of document at all sites in alignment with OSR and EQ documents
- progressing projects to improve the availability of system surveillance information
- continuing to increase work alignment with station needs and priorities
- establishing a component health report for the OH-180 programmable logic controllers used at Darlington
- initiating Pickering 2/3 de-fuelling support and other safe-store activities

2006 Focus Areas for CMWD

by Mike Brett

In addition to our regular work of providing support to the sites in our various technical

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areas we will have some particular focus areas for CMWD for 2006. We are placing increased emphasis on managing work/resources and commitments and tracking performance via metrics. For our technical work we have identified some key items that are captured as Director Milestones. These have been developed with our clients and stakeholders and will help drive alignment of our priorities and work programs. These milestones include:

- Recommendation on whether to continue or discontinue daphnia IQ toxicity testing
- Qualification of the Chemistry and Environment Monitoring program, which is the standard OPGN Laboratory Information Management software
- Cost/benefit analysis of hydrazine addition to the PHT (important for feeder/ fuel channel lifecycle estimates)
- Other work on the inhibition of hydriding of fuel channels
- TRF Life Cycle Management Plan – Phase 2
- TRF Cryoabsorber replacement
- Metrics in place for measuring the health of the Chemistry and Welding Programs

This is the “meeting commitments” part.

Other focus areas look more generally at managing work, tracking performance and communicating the value we provide to the business:

- Full implementation of EWMS will help us manage our work and balance resources. Also this data will be used to show senior management in a consistent way, in business language, how many resources are allocated to what work and it's value to the business. This includes determining how much effort we

expend in managing the work of others we contract work to, such as Kinectrics.

- Moving beyond compliance with the Corrective Action Program, will see us use trend information to help us improve our own performance as well as that of others. That will mean being more self-critical.
- A Department scorecard with performance against key metrics measured monthly will provide a regular barometer of our successes and where we need to concentrate our efforts. This will, along with the items above, help drive value enhancement (both of us and our contractors)
- We will work on corrective actions identified in a self-assessment on work management practices within our department that we performed in 2005.
- We will also look to improve the performance of our peer teams in the Chemistry, Welding and Heavy Water/TRF areas, in addition to developing and reporting program health metrics.

In addition, the department will be involved with other ESD-wide initiatives. All of these activities will take us in the direction set by Pierre for the business plan and ensure we are working consistently as part of the ESD team with our clients and stakeholders in other parts of OPGN.

2006 Focus Areas for Engineering Mechanics

by Dave Austin

2006 will bring a mix of both old and new. We will continue to respond to emergent issues in support of the operation of the power plants and support the life cycle management of steam generators and feeders. New for this year will

be an increased focus on delivering to a set of Director's milestones, an agreed set of high profile and priority items which have been identified by either one of the Station Engineering Directors or Fred. Our success as a team will be measured on how well we deliver. Some of the more challenging products this year include establishing Program Health metrics for SESA Software, PIP and Steam Generators with the development of specific actions to improve the programs over time. Advanced Feeder Stress Analysis (AFSA) will be completed at all stations in support of the feeder thinning issue. A PC based version of STANPIPES software will be delivered the Division. Finally, there are the things we don't know about yet, but are out there waiting to challenge us. When they do, we will rise to meet them.

2006 Focus Areas for Engineering Program Integration

by Don Wilson

The EPI department is a fairly new area which initially was focused on the transition of the Environmental Qualification Program from a project to a sustaining entity. In the past year Fire Protection Engineering Section and a Component Programs initiatives have been added to the portfolio. The following is a summary of the focus/direction of each of these areas in 2006:

Sustaining EQ:

EQ section has made considerable contribution in transitioning of the organization from the Project phase to the Program phase in 2005. The year 2006 brings more opportunities as the EQ program prepares the road map to integrate the EQ process with the existing processes within OPG. The focus of the EQ program in 2006 will be in the following areas:

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- Fully staff and plan the training of the EQ section. The section is approved for 8 FTE; 7 have already been hired.
- Look for opportunities to stream line the EQ processes with the existing ECC and procurement processes. There is an initiative to Benchmark Bruce Power for a generic approach to procuring EQ material. Additionally, EQ needs to ensure that the newly rolled out risk based ECC process has all the controls to identify and preserve the Nuclear Plant's Environmental Qualification and documentation.
- One other initiative by the section is prepare a Business Case and plan to set up OPG to provide third party dedication to procure EQ elastomers.

The overall objective of activities of the EQ section in 2006 is to streamline the program with existing process and optimize the program for cost savings in the long term.

Component Programs:

The focus of the Component Program area will be to provide a lead role for the oversight and monitoring of Engineering Programs (ie.establishing Peer Teams, reviewing OPEX, developing performance metrics etc.) Starting with the component program areas, our vision is to have implemented a 'tiered' approach to program oversight, including standardized program health reporting metrics and templates.

This initiative has started with Engineering Programs within ESD and is being considered in other parts of the corporation.

Fire Protection Engineering:

The focus for the Fire Protection Engineering Section is to:

A. Seek cost effective administrative and technical solutions to life and nuclear safety issues at OPG-N nuclear power plants. Examples are

- Revised fire protection system inspection and testing requirements
- Business case provided for an effective FSA maintenance strategy
- Develop training requirements for engineers supporting fire protection program

B. Ensure that OPG-Ns fire protection position is adequately addressed by the codes and standards.

- Provide technical expertise to codes committees.

2006 Focus Areas for Nuclear Safety & Technology

by Mike O'Neill

The 2006 NSATD work program direction will build on last year's overall strategy:

- Develop engineering programs (F&FC, PRA, RS) to meet CNE expectations, with particular attention on the PRA program (leading to full compliance in 2007)
- Maintain support for the station initiatives in DN Navigator, PB 85-5, and PA Pathway to Excellence
- Meet CNO/CNE objectives (e.g. implementation of Q-list initiative)
- Progress initiatives with the CNSC related to BEAU, Risk Informed decision making and GAI closure.
- Continue to improve effectiveness and

efficiency with our principal contractor NSS

- Continue to leverage COG R&D (and other) activities to support CNSC issue resolution and maximize benefit for OPG

The department will also assess its mid-to-long term staff capability to meet projected OPG technical needs.

2006 Focus Areas for Projects Design Darlington

by Jeff Shemilt

In 2006 our mandate continues to be that of safely executing the Darlington Business Plan. Specifically we will be involved in the design of projects in the portfolio.

There are many projects in the portfolio. However, a short list includes such items as Feeder Replacement, Environmental Qualification Component Replacements, Public Address System Upgrades, Phase IV Fire Protection, Chiller Replacements, Liquid Chlorination System Upgrade, Condenser Efficiency Modifications, Turbine Generator Control Upgrades, Auxiliary Heating System, PSVS Temperature Alarm Monitor & Reliability Upgrades and Standby Generator Controls Replacement. We will improve our milestone performance, by ensuring that we commit to what we can deliver. This means typically that when we have sufficiently progressed conceptual design we will commit to completing preliminary design, and similarly when we have sufficiently progressed preliminary design we will commit to full EC approval.

We will use EWMS to enable us to assess, plan and resource level our work. We will work with our colleagues to ensure that we are in alignment with the Outage and Innage milestones.

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We will focus on improving our use of design agencies. In addition we will work with our counterparts in Projects and Modifications, and the Station to enhance the value of projects. This will require us to understand the value that each project should bring to the business and as a team ensure that this value is achieved.

2006 Focus Areas for Projects Design Pickering

by Carl Daniel

Project Design Pickering is going to be facing a challenging year. There are over 90 ongoing and new projects that are in progress for 2006. Some of these projects are very resource intensive and proving to be complex and arduous such as replacement of the stand by generator governor system. Other ongoing projects such as boiler divider plate skin fix, although having been done several times continue to demand attention as changes are made to improve and reduce the time needed to execute.

The list of projects in the portfolio that will be supported range from modifications to the Cafeteria to relocating Liquid Zone Pumps and replacing the Emergency Power Generator Control Systems. In order to manage the large workload, a large emphasis will be placed on work planning and milestone adherence. Each project will be broken into 3 milestones, Conceptual Engineering "+", DCP issue, and Closeout. These will be committed to in series, allowing proper scoping of work and estimating of resources. This will allow the department to deliver on its commitments reliably, and only promise what we can deliver when we can deliver it. Again, this is going to be a challenging year.

EPI Staffing Update

An article by Jane Tawfik

The Sustaining EQ Program Section has been approved for 8 FTE in the year 2006 and a Section Manager. The budget was allocated and personnel are being hired. As of January 03, 2006, a total of seven personnel were hired with different start dates. The EQ hired staffs break down is as follows:

- **Russ Gomme** was hired from the Pickering A organization. He was a system engineer for containment for the last 14 years. He is looking forward to a new challenge with the sustaining EQ organization and we are looking forward to having him on board. Russ brings in a wealth of knowledge on the OPG engineering, work control and maintenance process which will help the sustaining team as they work towards integrating the EQ requirements into existing programs.
- **Terry Price, John Sams, Dan Buhoci, Anca Dobrescu and Neal Woon Fat** are external hires. They have been working with OPG (Pickering A and B) on the EQ project from three to ten years. They provide expertise in the EQ processes, EQ assessments, procurement, design and implementation. By having the EQ contractors on board assures the corporation that the years of experience acquired in implementing the program is not lost. They also provide the seed for the knowledge that we need to transfer to the organization as we mature to a fully integrated EQ program.
- **Dave Silvestro** is a new Mechanical Engineering graduate from McMaster University. He will be joining Sustaining EQ Section the summer of 2006. After going through the required new graduate training, a

mentor will be assigned to him as he starts the required EQ training.

- One position is still open within the section and is expected to be filled before the end of the year from an internal posting. In case you are interested in joining the team!

The EQ team is very enthusiastic about being part of transitioning the Environmental Qualification project into a sustaining program. They are very passionate about EQ, and this will come through in any discussion with them.

Completion of D₂O in H₂O Leak Detection System Upgrade at Darlington NGS

An article by Cezar Georgescu

The original Barringer analyzers installed at Darlington NGS for D₂O in H₂O leak detection became increasingly insensitive and unreliable over the last 15 years. The degradation in system performance could have impeded the D₂O in H₂O fast leak detection and, subsequently, the operator response. The poor performance could have resulted in an excessive loss of heavy water and tritium discharge into the environment. These analyzers also required very intensive and frequent maintenance (numerous recalibrations, filters in dirty sampling streams needing replacement every month, unreliable monitoring resulting in an extensive chem. lab manual sampling program, etc.). It is also important to mention that most of the maintenance activities also had to be performed in radiological environment.

In early 2004, the D₂O in H₂O Leak Detection Upgrade project was initiated to replace the

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problematic Barringer analyzers and provide a more reliable, sensitive and comprehensive Leak Detection D2O in H2O system. In conjunction with CANDU Owner Group (COG), the Darlington Projects Design staff has evaluated and selected the ABB Fourier Transform Infrared (FTIR) Spectroscopy D2O analyzer for the replacement. The selection of this type of measuring technique was based on the fact that the FTIR analyzer is more sensitive, consistent, and reliable. The new instruments also require very little maintenance. The design and procurement of the new analyzers were completed in 8 months and the first installation was completed in Unit 4, with the availability for service at the end of October 2004. The completion of the U4 installation in 2004 also met a WANO commitment requiring improvements to monitoring of the lake discharged water. The installation and commissioning in the remaining Units (1, 2 and 3) were accomplished by November 2005, marking another project milestone, namely, all 4 units now installed and in service. Moreover, the performance of the U4 operation over the last year was as expected and the feed back from other plant groups was extremely positive.

Currently, Projects Design Pickering is looking in transferring the design knowledge gained during the project at Darlington to the Pickering Barringer replacement project.

The D2O in H2O Leak Detection System Upgrade Project has been a great success, with all project objectives being achieved on time and budget. Even more noteworthy is the fact that the way the project was planned, controlled and executed by a team of dedicated participants from various departments (Performance Engineering, Design Projects, ESD - Software and Human Factors, Work Control, Operations and, of course, Projects Design Darlington).

Darlington's Transfer of Control Logic Modification

An article by David B. Diguier

Transfer of Control (TOC) is the logic used to determine when the control of a Unit should be transferred from the controlling DCC to the standby DCC. The bulk of the TOC logic is implemented in hardware using relays.

Why the change?

Along with cleaning up several outstanding configuration management issues and other minor deficiencies, the main reason for this modification was to address some logic discrepancies that did not meet the intent of the design requirements.

While testing the response of the Moderator System logic to a simulated moderator inlet pipe break, it was discovered that some of the DCC moderator interlocking logic was controlled by the General Purpose Control (GPC) program instead of the Moderator Temperature Control (MTC) program. This was contrary to the requirement that all system equipment must be controlled by its respective DCC control program.

Also, a separate review found that Steam Generator Level (SGL) logic alternate program status used logic that confirms SGL is running and not that it is controlling in the other computer, as is the case for the other DCC control programs. This meant that SGL was more vulnerable to a loss of DCC control should more than one master status D/I fail.

What were the Challenges?

As this modification required re-wiring the existing complex relay logic, the installation workplan had to be very precise in describing the steps to follow. The workplan contained approximately 400 steps which included wiring changes to be performed by the trades and verified by Field Engineering, as well as hold points for interim testing to ensure that each change was successful. As this modification was to be installed and commissioned during an outage, there was little room for errors or surprises.

The workplan was successfully completed without any work stoppages and only one minor field change. Kudos to **Mostafa El-Behairy** and **Gary Cleghorn** for crafting the high quality workplan logic! Installation on the other units will benefit from the experience gained on this modification as this workplan is now being used as a template for installation on the remaining Units. ❖

A Century of Powering Ontario

The 100th Anniversary of Public Power in Ontario will be recognized throughout the year by OPG and it will be an opportunity to showcase not only Ontario Power Generation's heritage, but to educate the public and reinforce to our employees and pensioners about the excellent job we do in meeting the daily electricity demands.

Commemorative 2006 Calendars will soon be available for pick-up at your mail location.

For more info, go to **OPG Today**.

Lessons Learned:

“ENGINEERING PROJECT MANAGEMENT – LESSONS LEARNED”

In an unprecedented collaboration, four prominent U.K. professional engineering institutions active in Canada are sponsoring the following series of lectures on the broad theme of *Engineering Project Management – Lessons Learned*. Presentation will be over the period September 2005 to May 2006. The aim is to introduce Engineering Project Management to engineers, technologists and managers working in all disciplines, with an emphasis on Lessons Learned through major real-life projects. The presenters are well-recognized practitioners in their respective fields and will distill their experience in managing highly significant projects over a wide spectrum, including Information Technology, Subways and Tunnels, Nuclear Power Plants, Giant Offshore Platforms, Manufacturing Plants and Aircraft Landing Gear.

- 17 Jan 2006 , Information Technology Project Management (*BCS*) , Toronto Board of Trade, Dixon Road, Etobicoke
- 21 Feb 2006 , Subway Tunneling (*ICE*) , Toronto Board of Trade, Dixon Road, Etobicoke
- 17 Mar 2006 , Lessons Learned from Engineering Disasters (*IMechE*) , Toronto Board of Trade, Dixon Road, Etobicoke

- 21 Mar 2006 , Hibernia Project (*IEE*) , Wyndham Bristol Place Hotel, Etobicoke
- 18 Apr 2006 , Pharmaceutical Plant (*IEE*) , Wyndham Bristol Place Hotel, Etobicoke
- 16 May 2006 , Large Aircraft Landing Gear (*IMechE*) , Toronto Board of Trade, Dixon Road, Etobicoke

Why Should You Attend The Engineering Project Management Lectures?

There are three reasons:

First the subject is vital. Technical undertakings of significance always grow into complex multidisciplinary projects with resource, time, budget and cost constraints. Scope creep occurs. Risks have to be managed. Contingency planning is necessary. Therefore, project management has to be appreciated as a discipline in itself and its principles and methodologies need to be grasped. Above all, there must be awareness of the lessons learned from real-life projects.

Second, all the talks are by knowledgeable experts and practitioners. The introductory lecture will present the current Body of Knowledge in Project Management. Attendance at the talks should therefore help towards meeting requirements for Continuing Professional Development (CPD).

Third, we engineers have an obligation to ensure that the benefits of professional Engineering Project Management are available in a timely manner to society. This again requires us to understand not only the methodologies available, but also to take careful note of the lessons learned from the

execution of actual projects.

Who Can Attend?

The programme is open to all. Membership in any of the sponsoring societies is not required.

Attendance should be of value to anyone engaged in Project Management or just wishing to gain an insight into proven methodologies and practices in this area. Adding great interest to the lectures will be the speakers' presentation of their first-hand experience in facing challenges in major engineering projects, and the lessons learned. The series should be of particular interest to Directors, Managers, Engineers, Scientists, Technologists and Government.

Flyers will be created for each lecture and will be posted at www.imeche-ccb.org

Please visit this web site for programme updates and for the monthly flyers, which will include more detailed lecture information, location maps and additional contacts for registration.

To register for the entire series or for individual lectures, send an email to:

imechec@attglobal.net

Cost: There is no charge whatsoever for attendance at the lectures. Complimentary snacks will be provided. (Note: the Nov. 26 lecture is combined with a Dinner, for which there is a charge of \$45 per person, but if so desired the lecture alone can still be attended without cost.)

Parking: Although generally free, there may be a charge at a particular venue. ❖

We're Listening!
from the editor...

Author Appreciation

I would like to devote this space to thanking all the contributors to the newsletter in 2005. We had approximately 190 submissions in 2005 (plus some generic articles without specific authors). That represents a huge commitment by you, the readers, in supporting the ESD Newsletter. On behalf of the ESD Newsletter team, **We Thank You One and All!**

And just who are we thanking? The list of contributors is impressive. (If I've missed anyone in the following list, please accept my apologies. We didn't start tracking authors until the July newsletter (initiated by reader feedback!), so we had to do some sleuthing to identify earlier authors). Here are the contributors for 2005:

Not surprisingly, the ESD Newsletter Team has submitted the most articles, with each of us submitting monthly articles, plus other standalone articles. The numbers are: **Mike Adams** (19), **Mike O'Neill** (18) and **Fred Dermakar** (14).

Authors submitting more than two articles include:

Rick Hohendorf (7)	Carmina Maruska (6)
John McLean (6)	Mike Brett (6)
Jane Tawfik (5)	Kazem Rassouli (5)
Barry Fleet (4)	Cezar Georgescu (4)
Franca Mazzuka (4)	Harold Asmis (4)
Mike MacDonald (4)	Paul Bekeris (4)

Bob Blackburn (3)	Don Williams (3)
Jeff Shemilt (3)	Mike Veilleux (3) and
Peter Sharawy (3)	

Authors submitting 2 articles include:

Bryan Gillmeister	David Zekveld
Don Wilson	Gary Zakaib
Judy Wakeman	Maguid Nashid
Michelle Mejaski	Nalini Valliere
San Ho	Sharon Bisnauth and
Steve Lawrence.	

The remaining authors are:

Alan Carmichael	Alexander Liu
Alyssa Hall	Andy Zupan
Brian Berndt	Cathy Lampasona
Dan Vlaicu	Dave Graham
Dean Barlow	Douglas Cole
Eric Hung	Frank Dias
Frank Puzouli	Georg Kralik
Gregory Smith	Hayley Cook
Jim Kankinson	Joe Ramundi
John Chase	John Froats
John Kordowisko	Karim Osman
Katherine McCulloch	Keith Garel
Kenneth Guise	Kevin Newell
Mark Elliott	Mike Benjamin
Mike Francisco	Mike Groulx
Mike Stojakovic	Neil Rogers
Pamela McDermid	Paul Spekkens
Pierre Charlebois	Raju Chander
Russel Hourigan	Sid Sethi
Tao Qu	Thompson Lin
Todd Whyte	Vlad Hera, and
Yuskel Parlatan.	

Thanks for your commitment to the newsletter. And remember, **we are listening!** Send feedback to: (mike.adams@opg.com) ❖

HR Corner

[Hewitt Survey - ESD and Engineering & Mods Participation](#)

In an effort to gauge employee engagement, the Hewitt Survey was conducted OPG wide from November 30th to December 30th. The average OPG participation rate was 57%. Engineering and Modifications as a whole had an impressive survey participation result of 63%. Engineering Services produced an outstanding response with a participation rate of 74%. In his message to Engineering & Mods staff, John Froats expressed his sincere thanks to those who took the time to have their say:

"Your feedback will give us a better sense of what needs to be done in order to make OPG an even better place to work. For those of you who took the time to provide your valuable insights, please accept my personal thank-you. We will carefully review each and every piece of the feedback to help us set the next steps of our journey. Thank you for your participation."

John Froats

The survey results will be shared shortly after they are available from Hewitt. Everyone shares a responsibility in engagement: OPG senior management, line management, support organizations and employees themselves. Engagement is more than a number on a spreadsheet - it's about people working together, making a difference each and every day to create the best work environment possible.

If there are any questions, comments or suggestions please forward them to Michael at michael.macdonald@opg.com ❖

Other Articles of Interest



Nuclear power plants now the lowest-cost electricity-generating technology, new analysis shows

A new World Nuclear Association report, which distils recent independent studies, concludes that nuclear power has become, in most major countries, the least-cost means of producing added base-load electricity. Entitled *The New Economics of Nuclear Power* and prepared by an international team of industry experts, the WNA Report focuses on economic costs and attaches no weight to other attributes of nuclear energy.

“At this stage in the nuclear renaissance, this is the most definitive analysis of the costs of building and operating nuclear power plants in the 21st century,” said John Ritch, the WNA’s Director General. “Nuclear power has already attained widespread recognition for its benefits in fossil pollution abatement, near-zero greenhouse gas emissions, price stability, and security of energy supply. The impressive new development is that these virtues are now a cost-free bonus, because nuclear energy has become the world’s least expensive way to generate electricity.”

“Nuclear energy’s pre-eminence economically and environmentally has two implications for government policy,” said Ritch. “First, governments should ensure that nuclear licensing and safety oversight are not only rigorous but also efficient in facilitating timely deployment of advanced power reactors. Second, governments should be bold in incentivizing the transformation to clean-energy economies, recognizing that such short-term stimulus will, in the case of nuclear power, simply accelerate desirable changes that now have their own long-term momentum.”

Among the work incorporated into the WNA Report are recent studies by such respected bodies as the Massachusetts Institute of Technology, the UK’s Royal Academy of Engineering, the International Energy Agency (IEA), and the Nuclear Energy Agency of the OECD (NEA). The WNA Report finds that the increased competitiveness of nuclear power is the result of cost reductions in all aspects of nuclear economics: construction, financing, operations, and waste management and decommissioning. Among the cost-lowering factors are the evolution to standardized reactor designs, shorter construction periods, new financing techniques, more efficient generating technologies, higher rates of reactor utilization (i.e. increased capacity factors), and longer plant lifetimes. Higher capacity factors, it bears emphasis, have been found to be consistent with enhanced safety performance, as both are indicators of strong operational management.

The WNA Report highlights and confirms IEA-NEA comparisons based on data assembled even before recent surges in fossil prices. Total electricity costs for power plant construction and operation were calculated at two interest rates. At 10%, mid-range generating costs per kilowatt-hour are nuclear at 4.0 cents, coal at 4.7 cents,

and natural gas at 5.1 cents. At a 5% interest rate, mid-range costs per kWh fall to nuclear at 2.6 cents, coal at 3.7 cents, and natural gas at 4.3 cents. Increased fossil fuel prices tilt this balance still further toward nuclear power.

The WNA Report is available in print and can be downloaded from www.world-nuclear.org/economics.pdf. For information, contact the WNA at +44 (0) 207 451 1520: Stephen Kidd (kidd@world-nuclear.org) or Serge Gorlin (gorlin@world-nuclear.org).

The World Nuclear Association is the global organization that seeks to promote the recognition and peaceful use of nuclear power as a sustainable and environmentally valuable energy source. The WNA membership, spanning 32 countries, comprises a wide diversity of enterprises that together represent the preponderance of activity in the nuclear industry worldwide.

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Iron Based Hardfacing Alloys and Valve Packing Qualifications

Submitted by Jeff Wells

Review of OPEX, for both the Moderator and the Heat Transport Systems, has shown that valves were the single largest equipment issue for lost production. Examples of such issues included

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actuator grease, valve packing and hardfaced materials. Incorrect selection and application of valve hardfacing has lead to operation and maintenance problems in the past.

In response to the recent degradation of Liquid Injection Shutdown System valves, having 440C plugs, corrosion testing of the seat material showed premature degradation after 202 days exposure to low pH conditions of the Moderator Purification System.



Suitable alternatives to 440C seat rings, such as Stellite 6, NOREM-02 or -02A and Delcrome 910, were investigated. Delcrome 910 exhibited acceptable galling and corrosion resistance as a result. Applying the recommendations of this R&D work will improve component reliability, minimize maintenance costs and shorten outage duration

UNENE Graduates

Submitted by Sara Amirpour

University Network of Excellence in Nuclear Engineering (UNENE) is an alliance of a number

of universities, nuclear power utilities, and research and regulatory agencies for the support of nuclear education, and research and development capability in Canadian universities.

UNENE offers a part time program for students already employed in the Nuclear industry and provides courses in compressed weekend format. To complete the UNENE program, students need to take either 10 courses or 8 courses and an industry Project. The program also allows students to complete only few of the courses rather than the full masters program.

Some of the courses that have been offered to date have been, Nuclear Plant Systems and Operations, Reactor Physics, Nuclear Reactor Safety Design, Reactor Thermalhydraulics, Radiation Health Risks and Benefits, Project Management, Nuclear Materials, Power Plant Thermodynamics, Risks and Reliability, Instrumentation & Control.

The first group of students graduated from the program in December 2005 is shown in the attached photo. These individuals had started approximately in the fall of 2003 and completed their studies in about 2 years. It has been an interesting and exciting learning period for all of them involved. It has been a period that has involved family time sacrifices, assignments, projects, exam time anxiety and the joy of studying part time while working full time.

This is a great time to pursue a Masters degree in Nuclear Engineering especially with all the recent discussions regarding building new Nuclear power plants and with the aging of the existing plants. However, this program continues only if there are enough applicants interested in the program. If you are interested in this program, please seek your supervisor's approval first and then apply to one of the current approved universities such as McMaster, Western or Waterloo for official admission. Other universities like Queens and U of T are

currently in the process of putting a process in place for registration. The detailed admission requirements along with other useful information are listed in the following Web site: www.unene.ca.

It is recommended that applicants join this program early in their careers to be able to use the knowledge that they gain from this program in their day to day work. However, there are no limitations based on any applicant's seniority to apply for this program.

In closing, it is important to acknowledge the efforts of OPG Nuclear and specifically Engineering Training for providing this opportunity to participate in this program that is flexible, challenging and rewarding. In addition, the effort and contribution of all the professors who have greatly contributed in the program and have made it what it is today need to be recognized.



Left to right (back)

Mahmod Terro, Nick Shirazi, Steve Strickland, Guiping Wang, Franco Mercaldi, Sudip Roy, John Froats (VP, Eng & Mod.) Paul Spekkens (VP, S&TD), Syed Rizvi (Manager, Training),

Left to right (front)

Nabeel Shabaneh, Ted Vu, Sara Amirpour, Godfrey Mendes



Curiosity Corner

Who/What/When/Where/Why

GentleCorrespondents: We had a lower than average response to our December contests – Xmas shopping overload? - But many correct answers. The object in the first photo was the microphone/control from the Polycom teleconference phones found in many of our conference rooms and our winner is **Russell Hourigan** from CCD.

The Christmas lights in the second photo are significant in that they are energy conserving LED lights which are rapidly replacing conventional incandescent bulbs in virtually all applications. **Sandy McKay** from CMW was our winner.

Russell, Sandy, W5 will be getting your prizes to you shortly.

December W5 “Challenge”

Now onto this month's contest: What is the object in the photo?



Please send your answers to michael.oneill@opg.com with “W5” in the message title.

Quote of the month

"Our challenge for the future is to demonstrate our continuous improvement and prove to our stakeholder that we are a competent operator by achieving “predictable and dependable performance. ... The Nuclear Executive Team and I recognize the progress made in the business and we are proud of our accomplishments. We are confident that we have the required staff, tools, and processes in place to deliver on our 2006 plan.”

P.R. Charlebois, CNO Perspective, January 16, 2006 ❖

People News

Dave Austin

Dave Austin joined ESD in December as the new Manager of the Engineering Mechanics Department. Dave’s career with OPG spans nearly 30 years including a wide variety of roles in the business. He joined Ontario Hydro in 1976, straight out of university and was assigned to Pickering, one of only 600 employees , just 4 units and parking wasn't a problem.

Since then he has been a Shift Supervisor, Commissioning Manager, Project Manager,

Training Manager and most recently completed 3 years as the Environment Manager at Darlington. Dave is very pleased to be completing his career back in Engineering where it all started. “I’d forgotten how much fun engineering can be”, he recently stated. As can be seen from the wide variety of things he's seen and done, he enjoys learning new things about the business and thrives on working with people. He is married with two grown up children and lives right here in Pickering. In his off hours he enjoys golf, skiing, curling and world travel.

Prem Bhatnagar

Electrical and Controls Projects Design - Darlington welcomes Prem Bhatnagar, P.Eng., M.B.A. as part of the group.

Prem has an extensive experience as an electrical design and procurement engineer in both Thermal and Nuclear Power Generating Stations (14 + years). He also worked in training, maintenance and operation of various other plants and participated in the design and build of 44KV, 27.6 KV and 13.8 kV, electrical substations, in Ontario. For the last two years (since 2003) Prem has been working at Pickering A and B Nuclear GS in the Operations Department as Nuclear Operator in training and became a qualified Nuclear Operator.

With several experienced OPG designers retiring over the next few years, Prem's experience will be more than welcome within the Darlington Electrical and Controls design team. His contribution to meeting the currently approved business plan will most definitely be very crucial. ❖