GE-Hitachi Nuclear Energy Canada Inc.

January 1 to December 31

2011

The information contained in this report concerns the performance and operation of GE Hitachi Canada's Class 1B nuclear facilities located in Peterborough and Toronto, Ontario. This report is prepared to meet licence condition 2.4. The content shows adherence to the GE Hitachi commitment to operate a safe Class 1B nuclear facility, as well as demonstrate compliance with fuel fabrication operating licence FFOL-3620.00/2020 and those conditions specified by the Canadian Nuclear Safety Commission.

Peterborough & Toronto

Revision	Description	Prepared By and Date	Approved By and Date
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01	Revision to liquid effluent release in Table 14 and Figure 9	S. Rheubottom, EHS Specialist April 5, 2012	P. Desiri, EHS & Licencing Manager April 5, 2012

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1 EXECUTIVE SUMMARY

This compliance report demonstrates that GE Hitachi Nuclear Energy Canada Inc. (GEH-C) has successfully met the requirements of the Nuclear Safety and Control Act.

Employee workplace exposures, as determined by CNSC approved methods and systems, were below regulatory limits and GEH-C Action Levels. Overall dose trends were favorable and consistent with an effective application of the ALARA (As Low As Reasonably Achievable - Social and Economic Factors considered) principle.

Air and water emissions are routinely measured to demonstrate compliance with the Canadian Nuclear Safety Commission's environmental protection requirements and the ALARA principle. All 2011 measurements were below GEH-C Action Levels and annual releases were a small fraction of regulatory limits.

No significant operational changes occurred at either facility in 2011. Upgrades were made to programs with the objective of achieving environmental health and safety excellence. Details are provided in the main sections of this report.

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2 INTRODUCTION

GE Hitachi Nuclear Energy Canada Inc. (GEH-C) operates a Natural Uranium Fuel Fabrication Operation comprised of two separate facilities. Ceramic grade uranium dioxide powder from Cameco Corporation is received at GE Hitachi's Toronto Facility where uranium dioxide pellets are fabricated. The majority of these pellets are shipped to GE Hitachi's Peterborough Facility and assembled into CANDU (Canadian Deuterium Uranium) reactor fuel bundles. A smaller quantity of pellets is fabricated for our parent company in Wilmington North Carolina. Finished bundles are then shipped to various customers. In addition, GEH-C is licensed to receive contaminated equipment for repair/modification in Peterborough.

The primary potential hazard is the inhalation of airborne UO_2 particles. Measurements are performed of airborne and surface traces of uranium as an indicator of process containment efficiency. Urine samples donated by employees are used to indicate if inhalation has occurred. A lesser potential hazard exists in the form of low-level external gamma and beta doses to employees.

Whole body, skin and extremity dose measurements are conducted to demonstrate compliance with the Canadian Nuclear Safety Commission's radiation dose limits and the ALARA (As Low As Reasonably Achievable - Social and Economic Factors considered) principle. All 2011 dose measurement results for employees were below regulatory limits and GEH-C Action Levels.

Air and water emissions are routinely measured to demonstrate compliance with the Canadian Nuclear Safety Commission's environmental protection requirements and the ALARA (As Low As Reasonably Achievable - Social and Economic Factors considered) principle. All 2011 measurements were below GEH-C Action Levels and annual releases were a small fraction of regulatory limits. Because of the very low potential for releases, environmental monitoring is not required at the Peterborough facility.

The primary safety goals and objectives established for 2011 and the corresponding results are in the following Table.

Goal	2011 Toronto Results	2011 Peterborough Results
Zero medical aid injuries	0	1
Zero lost time injuries	0	0
Every area inspected at least quarterly	100%	100%
100% training completed by December 31	100%	100%
Joint meeting with ergonomics team	N/A	Conducted
Job Safety Analysis update and training in 2011 for Fuel and Services	N/A	Conducted
Extend Behaviour Based Safety (Human Performance Tool) to other workgroups	Completed	N/A

Table 1: 2011 Primary Safety Goals

In 2011, production operations continued routinely. Natural uranium dioxide pellets were shipped to GEH-C's Peterborough Facility without incident. They were assembled into CANDU reactor fuel bundles. Finished bundles were then safely shipped to various customers.

Radiation Safety Instructions were issued for the receipt of contaminated equipment from Nuclear Reactor Sites for repair or modification at the Peterborough facility. These tasks were carried out safely and successfully with the involvement of the Environment, Health and Safety (EHS) department.

3 FACILITY OPERATION

Plant operations progressed well throughout 2011. Plant personnel followed procedures satisfactorily, as reflected in internal audits, radiation survey and air sampling measurements.

There were no significant modifications made to the operation in 2011. Facility improvements are considered proprietary and are submitted separately to the CNSC.

A total of 37 internal audits were conducted in 2011. Details on the scope and findings are provided in subsequent sections of this report.

There were 14 external agency inspections in 2011. This included the CNSC, and Human Resources Skills Development Canada. No audits from external regulatory agencies were conducted.

4 PRODUCTION

All possession and processing limits, as specified in license conditions, were met. Production data is proprietary and is supplied to the CNSC in Appendix C under separate cover. There was a three-week shutdown in the 3rd Quarter for both sites. There was a two week shutdown in the 4th Quarter of 2011 in Peterborough and a four week shutdown in the 4th Quarter in Toronto. Shutdowns are for engineering projects and equipment maintenance.

A small amount of contaminated waste from the Peterborough facility is sent to the Toronto facility where it is combined with a larger volume and shipped together to an approved facility. In Toronto, only about 0.006% of the uranium that is processed ends up in waste streams. Nearly all material is used in the product or recycled back to the supplier.

5 FACILITY MODIFICATIONS

There were no significant facility modifications, repairs or maintenance in 2011. In mid-2011, a modular space addition to building 21 in Peterborough, which consists of office space, washrooms and a lunch-room, was completed. This addition does not affect the licenced area. Noise abatement was installed around air conditioning units at the south end of the Toronto facility and around the Rotoclone unit.

5.1 Machine Shops

In response to a 2010 lost time injury in the Services Shop, several improvements to machine safety were completed in 2011. These include:

- Provision of designated tools/measures to clean parts, e.g., rigid brushes, compressed air, etc.
- Third party review of all guarding for all manufacturing locations to include maintenance shop equipment
- Revision of job safety analyses to include all lessons learned (details in Action Tracking System) from October 6 2010 injury and new machine specific procedures to supplement Job Safety Analysis leveraging where possible
- Re-training of all management and supervisors on hazard/safety recognition

- On site training program, with input from an approved technical college, for all mechanists, technicians and millwrights on machine best practices for safety particularly but not limited to human interaction with rotating machinery

5.2 Programs

A Safety and Security Culture Council was established globally for GE Hitachi. The purpose is to incorporate safety culture improvement best practices from other sites, such as the Institute of Nuclear Power Operations, using checklists and other standards for assessing and improving safety culture.

GEH-C now has a standardized concern-reporting process across that uses the Gensuite concern reporting tool. In addition, employee recognition programs were standardized across GEH-C and now include rewards for raising concerns.

5.3 Organization

The fuel production operations organization welcomed two new and experienced shop floor supervisors in 2011. The Toronto shop floor supervisor began his new role in January of 2011. The Peterborough shop floor supervisor began his new role, which was a transfer from the Nuclear Services Manufacturing division, in August of 2011. To fill that vacancy, a new shop supervisor for the Nuclear Services Manufacturing division began in October of 2011. In addition, a new resource was hired to perform Environment, Health and Safety tasks in the Services shop.

6 SAFETY AND CONTROL AREAS

6.1 Management

6.1.1 Management System

Program improvements to the GEH-C documented Management System are on-going. The program implementation and effectiveness was reviewed with Management on March 5, 2012 for the 2011 year.

6.1.1.1 Licensed Activity Related Audits

The following Table provides a summary of internal audits conducted in 2011.

Peterborough	Number of Audits	Number of Findings
Peterborough Program Self Assessments*	21	N/A
GEH-C Cross Business Audits	1	7
General Electric Cross Business Audits	0	N/A
GEH-C Compliance Audits	11	7
Environmental Self Assessments*	6	N/A
Environmental Internal Audit	1	0
Toronto	**Number of Audits**	**Number of Findings**
Toronto Program Self Assessments*	21	N/A
GEH-C Cross Business Audits	1	6
General Electric Cross Business Audits	0	N/A
GEH-C Compliance Audits	10	6
Environmental Self Assessments*	6	N/A
Environmental Internal Audit	1	3
TOTAL (excluding self-assessments*)	37	29

Table 2: Summary of Internal Audits

*Self-Assessments are an internal scorecard review of Health and Safety framework elements against General Electric expectations.

The above do not include internal audits that form part of the ISO 9001/Z299 system which have a product focus but do share some overlap with safety, e.g., management system, documentation, training etc.

No external audits were carried out by GEH-C during the review period which relate to the licensed activities at the facility.

6.2 Human Performance Management

The training program is described in the license application document section 3.2 and outlined in the Quality Manual, Radiation Protection Manual and the Health and Safety Manual.

Operators and Technicians are trained and qualified to safely conduct their duties. This training includes on-the-job training, radiation protection and job safety analysis training.

The facilities are staffed with a sufficient number of qualified workers as well as the minimum number of responsible people to carry on the licensed activities safely and in accordance with the Nuclear Safety and Control Act and its Regulations.

6.3 Operating Performance

Plant supervisors and management conduct routine meetings at each site which include a discussion of health and safety concerns. Actions are assigned and tracked in the facilities Action Tracking System.

Internal health and safety self-assessments and radiation protection cross-business audits are conducted at both facilities annually. Findings and corrective actions have been closed.

6.4 Facility and Equipment

6.4.1 Safety Analysis

Modifications to the facility are made in accordance with Health and Safety Manual Procedure 14.0 *Management of Change and Preventative Maintenance* which requires review of environment, health and safety for new or modified facilities, processes, and new or relocated machinery, apparatus and equipment.

Significant modifications to the Peterborough facility completed in 2011 include;

- Completion of installation of an area and structure within Building 26 where work on contaminated equipment can be conducted
- Resurface Building 21 R2 area epoxy floor
- Installation of a new modular office building adjacent to Building 21
- Installation of a fire-separated lift truck storage area in Building 24
- Installation of fire separation at south end of Building 24 North

Significant modifications to the Toronto facility completed in 2011 include:

- Improvement of taper grinder workspace ventilation
- Shielding in north end of furnace area
- Roof top ventilation noise abatement

6.4.2 Physical Design

Significant facility modifications are listed in the preceding section.

The installation of the structure in Building 26 impacted the sprinkler coverage in Building 26. Sprinkler heads were installed within the new structure and tied into the Building sprinkler system to provide required coverage. The Fire Hazards Analysis was completed for Building 26 including the new structure. The installation of a fire-separated lift truck storage area and fire separation at the south end of Building 24 were in response to actions arising from the Fire Hazards Analysis for that building.

6.4.3 Fitness for Service

Preventative maintenance tasks deemed critical to safety are designated in the preventative maintenance system as described in Health and Safety Manual Procedure 14.0 *Management of Change and Preventative Maintenance*. This list is reviewed annually. In the event of equipment failure, the preventative maintenance program for that equipment is reviewed.

There were no such identified failures. However, there were two instances (out of about 400 scheduled) where inspections did not take place as scheduled. Corrective actions were put in place in both identified instances to ensure that the necessary inspections are conducted.

6.5 Core Control Processes

6.5.1 Radiation Protection

The major potential hazard is inhalation of airborne UO_2 particles. Measurements are performed of airborne and surface traces of uranium as an indicator of process containment efficiency. Urine samples donated by employees are used to indicate if inhalation has occurred and to monitor clearance of uranium from the body. A lesser potential hazard exists in the form of low-level external gamma and beta doses to employees.

Whole body, skin and extremity dose measurements are performed to ensure compliance with the Canadian Nuclear Safety Commission's radiation dose limits and the ALARA (As Low As Reasonably Achievable - Social and Economic Factors considered) principle. All 2011 dose measurement results for employees were below action levels and regulatory limits.

6.5.1.1 External Dose Monitoring Results

Thermoluminescent Dosimeters (TLD) are worn by all facility operators who handle radioactive material. The dosimeters record the Whole Body and Skin Doses received in each month (Toronto) or quarter (Peterborough) of the year.

TLD rings are worn on certain employee's hands for a one-week period each quarter. The test results and the weekly hours of contact are used to estimate the extremity dose.

Dosimetry statistics are summarized in the following sub-sections. Note that the Peterborough facility average reported in the 2010 Compliance Report was noticeably reduced as a result of the inclusion of TLDs worn by office workers. Previous averages included only employees working on the shop floor. This change in reporting was in error and has been corrected on the trending graphs.

6.5.1.2 Whole Body Effective Dose

Note: As Peterborough does not have any measurable internal dose, the effective dose is the TLD whole body dose.

	Peterborough	Toronto		
		Whole Body	Internal	Total Effective
Maximum Whole Body Dose (mSv)	7.06	7.78	1.70	7.78
Average Dose (mSv/person)	1.71	1.50	0.19	1.62

Table 3: Whole Body Effective Dose Summary

6.5.1.3 Equivalent Skin Dose

	Peterborough	Toronto
Maximum Skin Dose (mSv)	22.62	55.48
Average Dose (mSv/person)	4.54	10.81

Table 4: Equivalent Skin Dose Summary

6.5.1.4 Equivalent Extremity Dose

	Peterborough	Toronto
Maximum Extremity Dose (mSv)	56.12	160.64
Average Extremity Dose (mSv/person)	9.36	41.02

Table 5: Equivalent Extremity Dose Summary

6.5.1.5 Peterborough Trending

Dose results are analyzed to discern emerging trends. Graphs showing the average facility doses for the last ten years are shown in Figures 1 to 3.

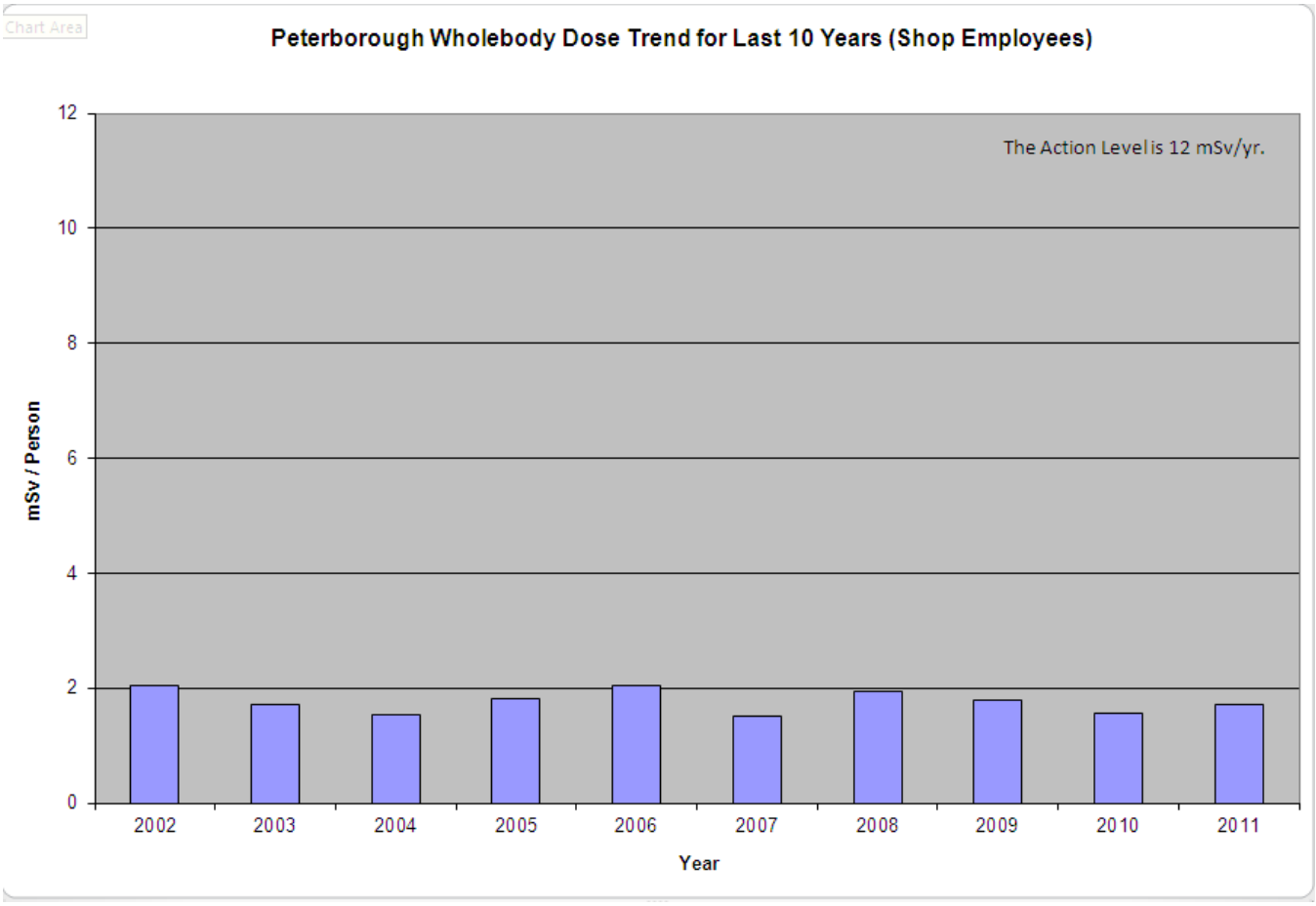

Figure 1: Peterborough 10-year Average Annual Whole Body Dose

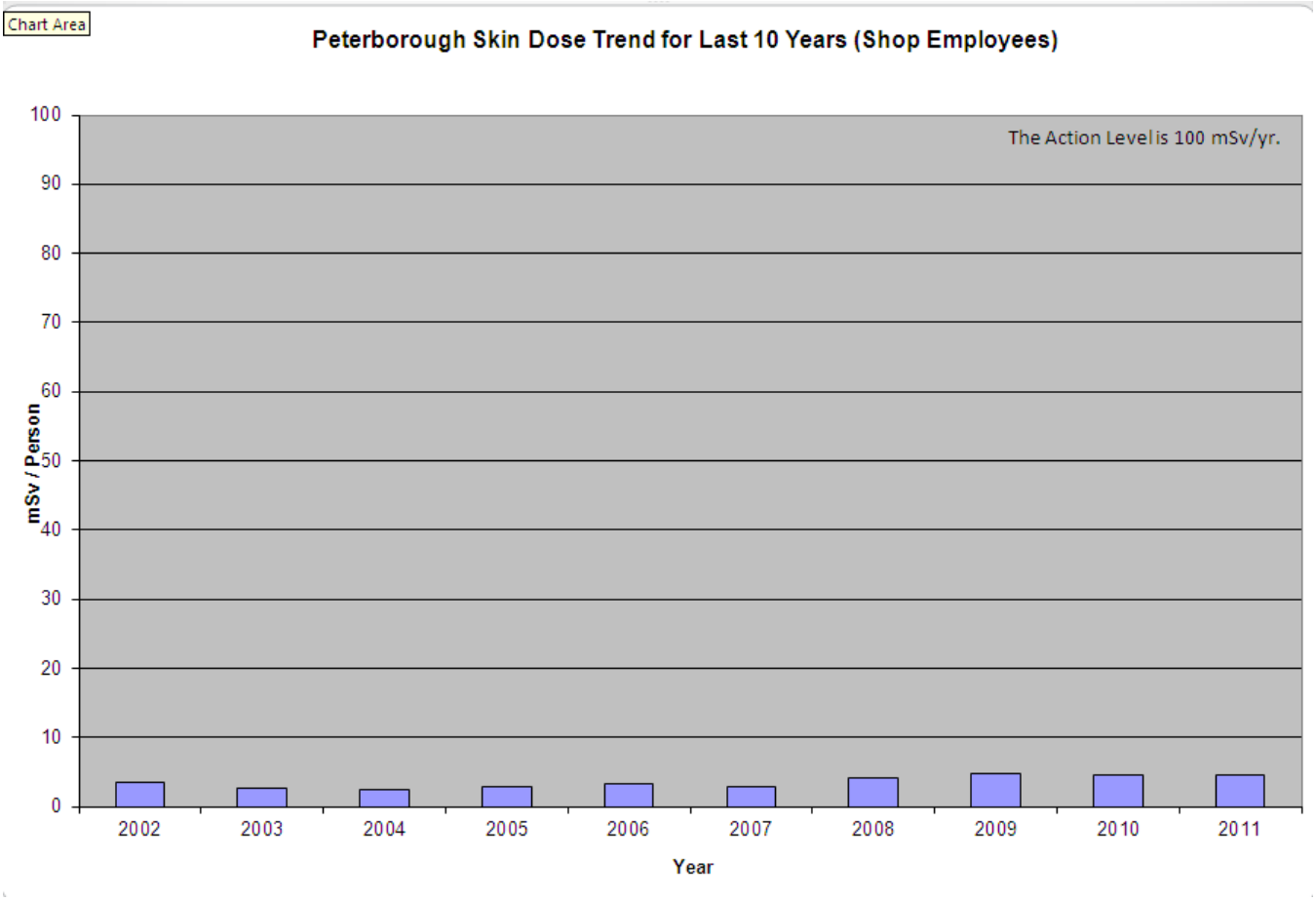

Figure 2: Peterborough 10-year Average Annual Skin Dose

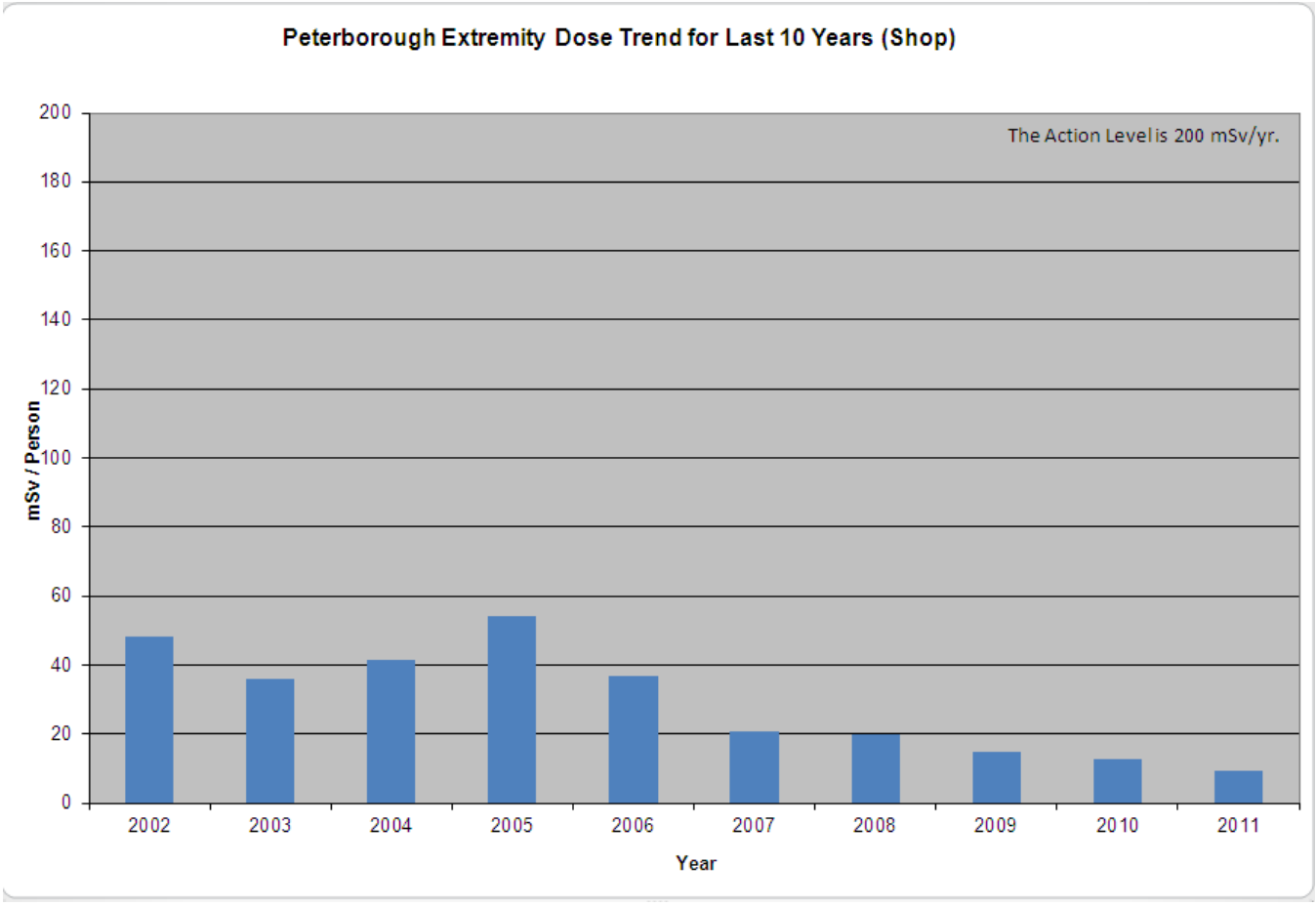

Figure 3: Peterborough 10-year Average Annual Extremity Dose

Trends are showing that average whole body dose has decreased year over year for the previous three years (2008-2010), while 2011 shows a slight increase which is in line with the increase in production quantities.

Skin doses remain a small fraction of the applicable limit and the GEH-C Action Level. There has been no obvious trend observed.

Extremity doses continue to show a decreasing average dose since 2006. This is primarily due to changes in how extremity doses are calculated. Ring testing, which was previously done on an annual basis, is now performed on a quarterly basis and the new measurements are considered more representative of actual doses.

6.5.1.6 Toronto Trending

Dose results are analyzed to discern emerging trends. Graphs showing the average facility doses for the last ten years are shown in Figures 4 to 6.

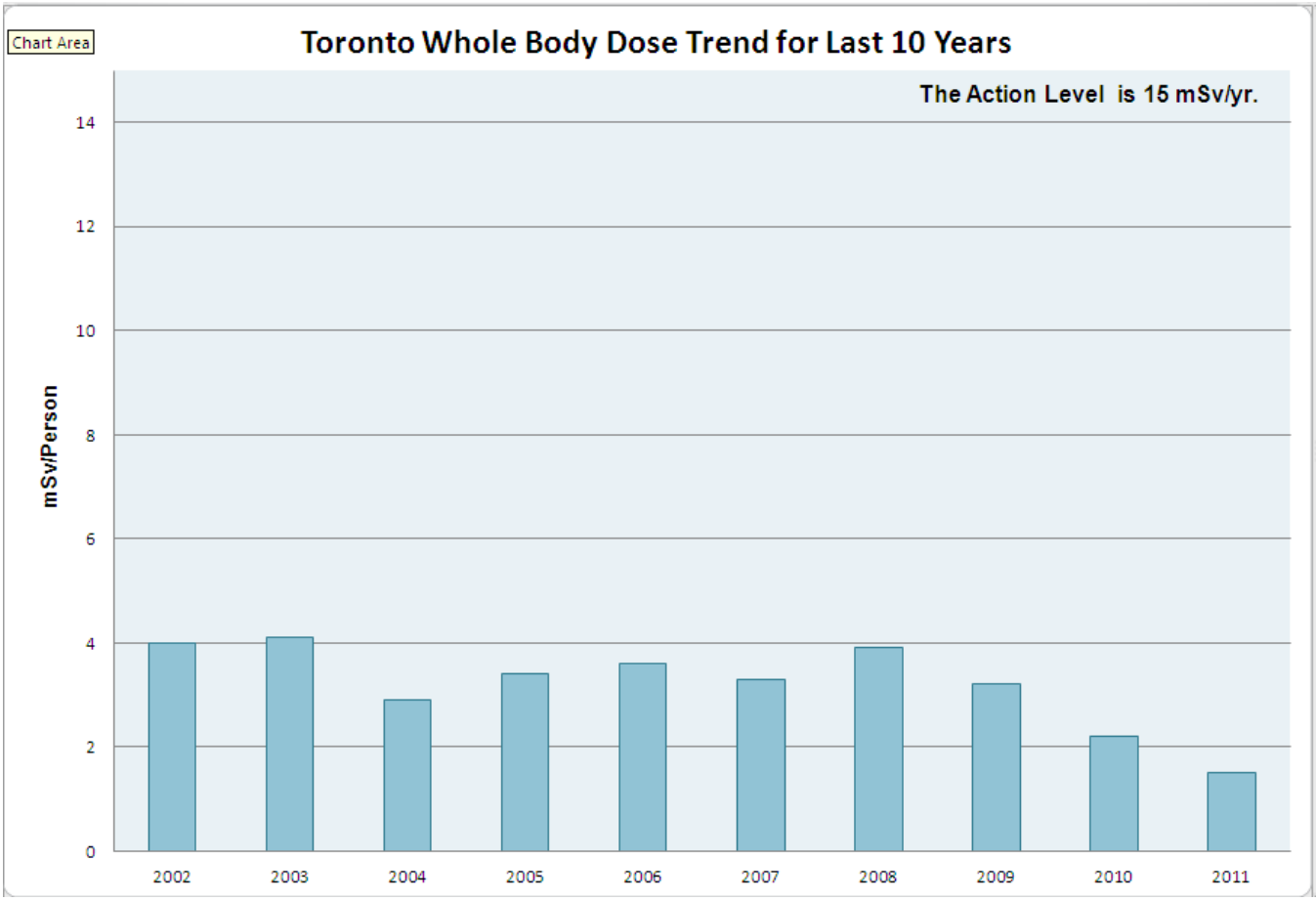

Figure 4: Toronto 10-Year Average Annual Whole Body Dose

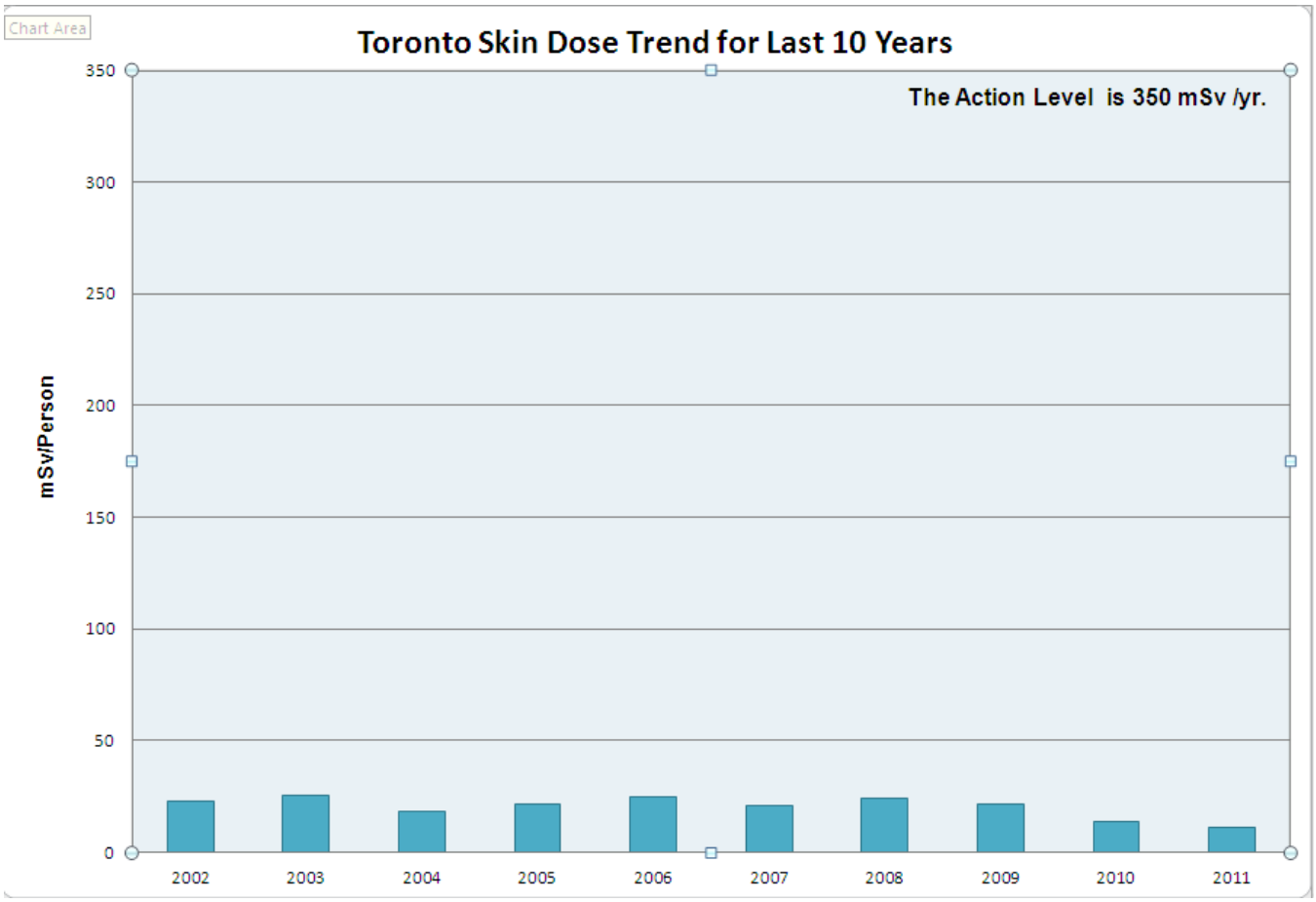

Figure 5: Toronto 10-Year Average Annual Skin Dose

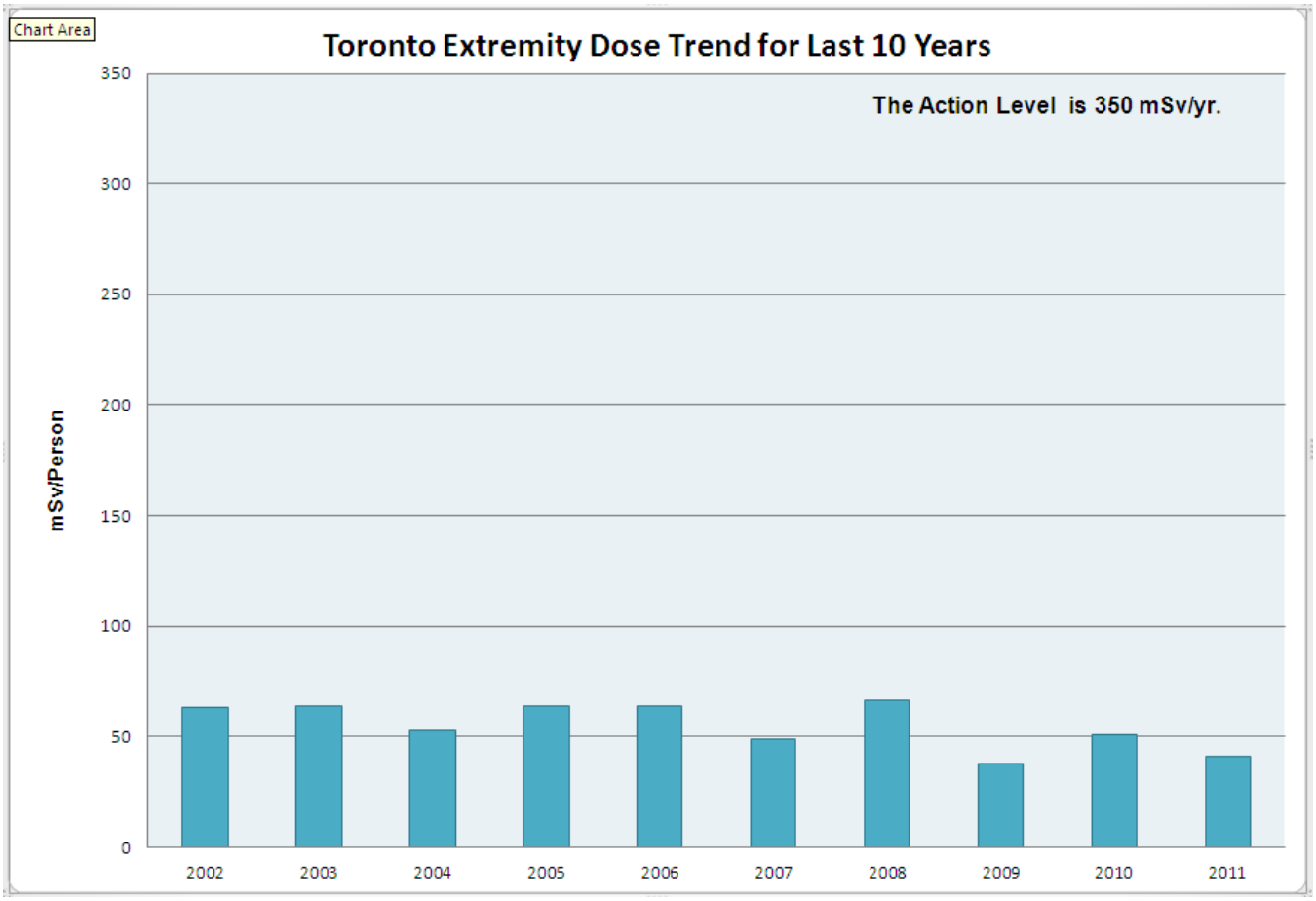

Figure 6: Toronto 10-Year Average Annual Extremity Dose

Trends are showing that Toronto average whole body dose has decreased year over year for the previous four years (2008-2011). Production has remained fairly consistent over the last few years. The year over year decrease in whole body dose is considered to be a combination of shielding improvements made in the Sort Stack, Grinding and Sintering areas and an improvement in ALARA awareness and operator experience.

Skin doses remain a small fraction of the applicable limit and the GEH-C Action Level. Average skin dose has decreased year over year for the previous four years (2008-2011).

Extremity doses continue to show a decreasing average dose since 2008. This is primarily due to changes in how extremity doses are calculated. Ring testing, which was previously done on an annual basis, is now performed on a quarterly basis and the new measurements are considered more representative of actual doses. Also, while the primary objective of shielding improvements was reduction in gamma exposures, there will also be a reduction in overall beta fields in the work area from the shielding.

6.5.1.7 Urinalysis Results

All Peterborough employees working greater than thirty hours in an R2 classified area or working as a roving inspector during the quarter, where exposed UO_2 material is processed, submit urine samples for uranyl ion analysis. All Toronto employees working where exposed UO_2 material is processed submit urine samples for uranyl ion analysis during the week/month (depending on the work area). The presence of uranium in the urine is an indication of recent inhalation of UO_2 dust or the systemic clearance of an established Thorax Burden. Urinalysis at GEH-C is used primarily as an inhalation indicator that may initiate a more definitive Bioassay Measurement.

Urinalysis results are summarized in the Table below.

	Peterborough	Toronto
Number of urine samples analyzed	80	1600
Number of samples above *Internal Control Level* (5 ug U/L)	0	4
Number of samples above *Action Level* (10 ug U/L)	0	0
Maximum result (ug U/L)	0.2	7.2

Table 6: Urinalysis Results Summary

Of all urinalysis samples from Peterborough processed between 2005 and 2011, only three have measured above 0.1 ug U/L (less than 0.3 ug U/L). These occurrences were below the internal control level. This demonstrates that the inhalation hazards at this facility are minimal and that current engineered and administrative controls, where applicable, are adequately controlling the risk.

In Toronto, a total of 4 sample results were above the internal control level of 5 ug U/L. All were below the Action Level of 10 ug U/L. All internal control level exceedances are investigated with the objective of identifying and correcting causes.

6.5.1.8 Contamination Control

Surface contamination measurements are conducted in manufacturing areas of each facility. The potential for surface contamination is greater in the Toronto facility since quantities of UO_2 power are received and handled. Contamination by itself is not necessarily an indicator of exposure potential but can be used as an indicator of housekeeping conditions. Loose surface uranium has the potential to become airborne. If this occurs, the air monitoring results will reflect the increase airborne concentration and appropriate corrective action is then taken. In the event of a measurement exceeding our Internal Control Level, the area is cleaned and re-swiped.

Surface contamination measurement results are summarized in the Table below.

	Areas and Classification	Number of Samples	Internal Control Level	Number Samples Exceeding Internal Control Level
Peterborough	Pellet Loading, Element Welding and Pellet Storage -R2	576	2200 dpm/100 cm^2	1
	Bundle Assembly, Inspection, Receiving, Building 24-R1	336	220 dpm/100 cm^2	3
	Met Lab - Active	148	220 dpm/100 cm^2	0
	Items, Main Hallway - Unclassified	52	220 dpm/100 cm^2	0
Toronto	R3-Powder Preparation, Pressing, Grinding, Laboratory	480	22,000 dpm/100cm^2	6
	R2-Sintering, Sorting & Stacking, Laboratory	456	2,200 dpm/100cm^2	14
	Active - Plant Washrooms, Laundry Room,	144	2,200 dpm/100cm^2	3
	Unclassified	240	220 dpm/100cm^2	0

Table 7: Surface Contamination Result Summary

Peterborough surface contamination remains steady. Surface contamination results are trended quarterly for review and discussion at the ALARA committee meetings and action taken to improve housekeeping in any indicated areas.

A goal of the Toronto ALARA committee in 2012 is to reduce the number of sample results above the *Internal Control Level* in R2 and R3 areas.

6.5.1.9 Facility Radiological Conditions

Routine gamma surveys are conducted at each facility. Peterborough conducts the survey on a monthly basis and Toronto on a quarterly basis. Dose rate results are summarized in the Table below.

	Peterborough	Toronto
Total Number of Locations Surveyed	399	104
Average Dose Rate (uSv/h) on Shop Floor	2.5	2.4
Average Dose Rate (uSv/h) in Storage Areas	12.4	6.1

Table 8: Routine Dose Rate Survey Result Summary

6.5.1.10 Air Monitoring

In Peterborough, each process workstation where open uranium dioxide pellets are handled is periodically monitored during routine operations for airborne uranium dioxide.

In Toronto, each process workstation is monitored continuously during standard operating conditions for airborne uranium dioxide.

Non-routine work functions, such as machine maintenance, modifications, etc. are controlled by Radiation Safety Instructions (RSI). The RSI specifies protective measures, including protective measures to reduce exposure to airborne UO_2. This may or may not include air monitoring and/or respirator use.

Routine workstation air sampling results are summarized in the Table below.

	Peterborough	Toronto
Number of Workstations Sampled	3	19
Total Number of Samples Collected	48	4733
Total Number of Samples Exceeding *Internal Control Level* (facility and area specific)	0	4
Total Number of Samples Exceeding *Action Level* (facility and area specific)	0	0
Average Concentration (dpm/m^3)	2.16	8.0
Maximum Value Recorded (dpm/m^3)	14.2	270

Table 9: Workstation Air Monitoring Summary

In Peterborough, average and maximum workstation air monitoring results continue to remain negligible.

In Toronto, all four internal control level exceedances occurred at the same monitoring location. Two of these were connected with a single cause. Corrective actions have been implemented.

6.5.1.11 Exceedances of Regulatory Limits or Action Levels

No *Action Levels* or regulatory limits were exceeded in the 2011 calendar year.

6.5.1.12 Radiation Protection Program Effectiveness

Elements of the Radiation Protection Program such as dose monitoring, contamination monitoring, radiation field surveys, etc. are reviewed internally by the ALARA Committee on a regular basis. Details of the reviews are contained in meeting minutes.

An internal audit of the radiation protection program, with a focus on radiation protection program effectiveness, is conducted annually. A copy of the report is provided to the CNSC separately.

6.5.1.13 Radiation Protection Program Improvements

A revision to the Radiation Protection Manual was initiated in 2010 and has been completed for Peterborough. A revision to Toronto's Radiation Protection Work Instructions is on-going. This includes a review of current radiation safety practices.

Toronto ALARA improvements include shielding at the furnace conveyor and ventilation improvements at the Taper Grinder.

6.5.1.14 Summary of Radiation Protection Program Performance

The ALARA Committee Peterborough initiated a goal to reduce collective employee dose by 5% in 2011 compared to 2010. Employee doses increase directly with the amount of UO_2 processed. Dose reduction was reviewed after correcting for the amount of UO_2 processed in the calendar year. A 2% reduction in collective employee dose was measured in 2011 as compared to 2010.

The ALARA Committee Peterborough has established two goals for the 2012 calendar year. They are:

- 5% reduction in collective whole body radiation dose for the fuel shop.
- Implement a process for new projects and facility modifications to be reviewed by the ALARA Committee when applicable.

The ALARA Committee Toronto initiated a goal to reduce the average annual employee dose to <3.2 mSv. This goal was achieved. Toronto also targeted a maximum annual employee dose to <12 mSv. This was also achieved.

The ALARA Committee Toronto has established three goals for the 2012 calendar year. They are:

- Achieve less than 3.2 mSv annual whole body dose average and less than 11 mSv annual whole body dose maximum.
- Improve the ventilation system to achieve air monitoring results to < 10 dpm/m^3 average.
- Improve cleanliness in areas with high swipe results.

6.5.1.15 Summary of ALARA Committee Performance

The ALARA Committees meet quarterly at a minimum. The committees met four times during 2011. ALARA Committee goals and targets are provided in section 6.5.1.14 above.

6.5.1.16 Summary of Radiation Protection Training Program and Effectiveness

The Training Tracker Tool in Gensuite® tracks radiation safety, and other, EHS-related training. Gensuite is a suite of award-winning, integrated Web applications enabling compliance and EHS excellence. An internal or external specialist in radiation protection is contracted periodically to provide classroom training to new and continuing NEWs. Testing is performed on completion of the training to demonstrate employee understanding. Training Tracker is updated with these results. The Table below shows 100% completion of initial and refresher Radiation Safety training.

Course Name	Peterborough		Toronto	
	Number Completed	% Required Complete	Number Completed	% Required Complete
Radiation Safety (Initial)	13	100	8	100
Radiation Safety (Refresher)	18	100	46	100

Table 10: Radiation Protection Training Summary

6.5.1.17 Summary of Radiation Device and Instrumentation Performance

All radiation devices and instruments were maintained in a state of safe operation. Radiation calibrations are conducted within 12 months of the previous calibration. Where calibration is expired or where detectors fail calibration, they are removed from service until they are repaired and meet radiation calibration expectations.

6.5.1.18 Summary of Inventory Control Measures

A current inventory of non-production radioactive sources is maintained by each facility. The inventory for each facility is provided in Appendix A and B, submitted to CNSC under separate cover.

6.6 Conventional Health and Safety

6.6.1 Health and Safety Program Effectiveness

Elements of the Health and Safety Program are implemented and reviewed by the Workplace Safety Committee (WSC). The Peterborough WSC targets three inspections per month. The Toronto WSC targets one inspection every three weeks. Regulatory findings resulting from these inspections are closed within 30 days.

A Human Resources and Skills Development Canada (HRSDC) completed an inspection in Peterborough in December 2011. Six findings were generated on an Assurance of Voluntary Compliance.

6.6.2 Workplace Safety Committee Performance

Each facility committee meets on a monthly basis. In Peterborough, twelve meetings were held, however July and August meetings did not meet quorum. Toronto did not meet the minimum number of meetings due to personnel changes and an extended shut-down period.

The Peterborough WSC was identified by an HRSDC inspector as a best practice. WSC sent the HRSDC inspector monthly reports (minutes and inspections) to support HRSDC's project to identify effective WSC characteristics.

2011 goals for each facility are summarized in the following Table.

	Goal	Actual	Result
Peterborough	Zero Medical Aid Injuries	1	Not met
	Zero Lost Time Injuries	0	Met
	Every Area inspected at least quarterly	100%	Met
	100% training completed by Dec 31	100%	Met
	Joint meeting with Ergonomics team	Conducted	Met
	JSA update and training in 2011 for Fuel and Service	Conducted	Met
	Recognition of the team	Conducted	Met
Toronto	Zero injuries	0	Met
	Zero lost time	0	Met
	Inspections	100%	Met
	Training	100%	Met

Table 11: Workplace Safety Committee 2011 Goals and Results

2012 goals for Peterborough are summarized as follows:

- Zero Recordable Injuries
- Zero Lost Time Injuries
- Every area inspected at least quarterly
- 100% training completed by Nov 1
- Joint Meeting with other EHS Committees
- Canada Labour Code part II training
- Review and validate the WSC charter
- Review a section of the Canada Labour Code part II at meetings

2012 goals for Toronto are summarized as follows:

- Zero Recordable Injuries
- Zero Lost Time Injuries
- Every area inspected at least quarterly

- 100% training completed by November 1, 2012
- Determine need for additional safety training
- Increased employee participation as measured by number of concern reports

6.6.3 Health and Safety Program Improvements

6.6.3.1 Peterborough

In 2011, a third party was hired to complete a review all equipment based on the Canadian Standards Association Z432 machine guarding standard. A priority list was developed which has resulted in an upgrade to the majority of high priority machines to meet requirements with Z432.

In addition new fall protection systems were designed and installed with resultant training of relevant employees for unloading/loading transport flatbed trucks.

6.6.3.2 Toronto

The Toronto plant completed the following third party assessments in 2011:

- Furnace safety
- Hydrogen distribution
- Hydrogen storage facility

6.6.4 Hazardous Occurrences

No hazardous occurrences occurred at either facility in 2011. No lost time incidents occurred at either facility in 2011. There were a total of 15 first aids in Peterborough and 8 first aids in Toronto. There were a total of 27 near misses in Peterborough and 19 near misses in Toronto.

6.7 Environmental Protection

6.7.1 Air Effluent Monitoring

A single process air emission point exists for in the Peterborough facility. The R2 Area Decan Station exhausts through a HEPA absolute filter. The GEH-C Peterborough Facility performs weekly in-stack monitoring by removal of a filter capable of trapping natural uranium dust in the exhaust system.

The Toronto facility performs continuous in-stack sampling and boundary air monitoring. Boundary samples are high volume air samples drawn at five positions around the facility perimeter. The in-house filter papers are analyzed in-house and externally. Boundary samples are analyzed externally only.

A summary of air samples are in the following Tables:

	Peterborough	Toronto
Number of Air Exhaust Samples Taken	48	747
Number of Samples > Action Level (1 ug/m^3)	0	0
Average Concentration (ug U/m^3)	0.0025	0.002
Highest Value Recorded (ug U/m^3)	0.0227	0.18
Total Uranium Discharge to Air (g)	0.0106	9.2

Table 12: Summary of Uranium Releases to Air

	Toronto
Number of Boundary Samples Taken	260
Number of Samples > Action Level (0.08 ug/m^3)	0
Average Concentration (ug U/m^3)	0.0011
Highest Value Recorded (ug U/m3)	0.0047

Table 13: Toronto Boundary Air Quality Monitoring Summary

6.7.1.1 Trending

Air monitoring results are trended over 5 years as shown in the Figure 7: Peterborough Air Emission Trending and Figure 8: Toronto Air Emission Trending.

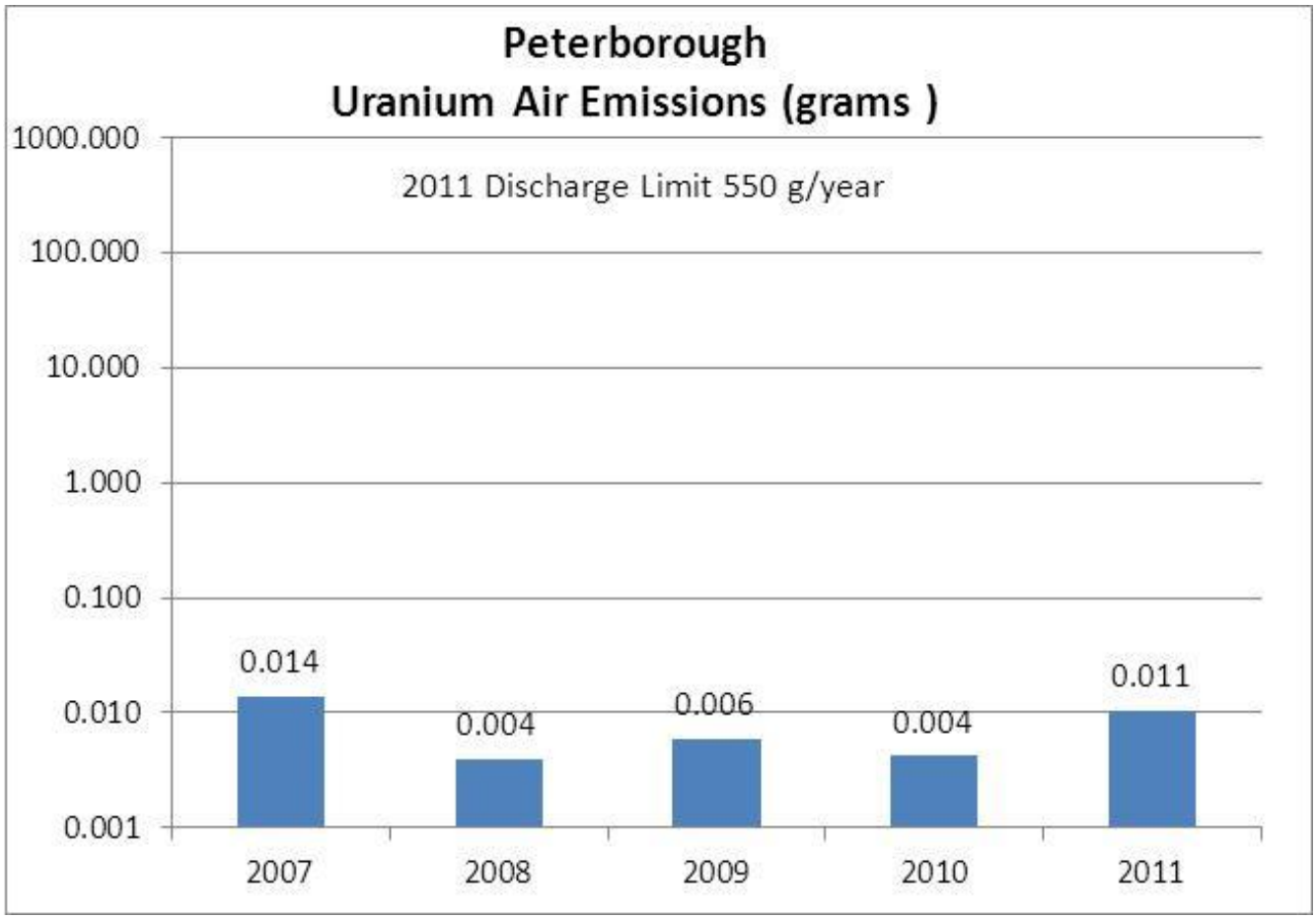

Figure 7: Peterborough Air Emission Trending

Note: the above graph has a logarithmic scale

Air release results continue to remain low and well below the Action Level of 1 ug/m^3. The annual discharge trend is shown in the above Figure. Doses to the general public as a result of air releases continue to remain negligible.

The total release of 0.0106 g in 2011 is well below the discharge limit of 550 g that is based on a trivial dose of 50 µSv.

The five year trend graph of air releases shows a fairly stable five year performance consisting of very low air releases. The increase to 2011 may be due to an increase in the production amount from 2010.

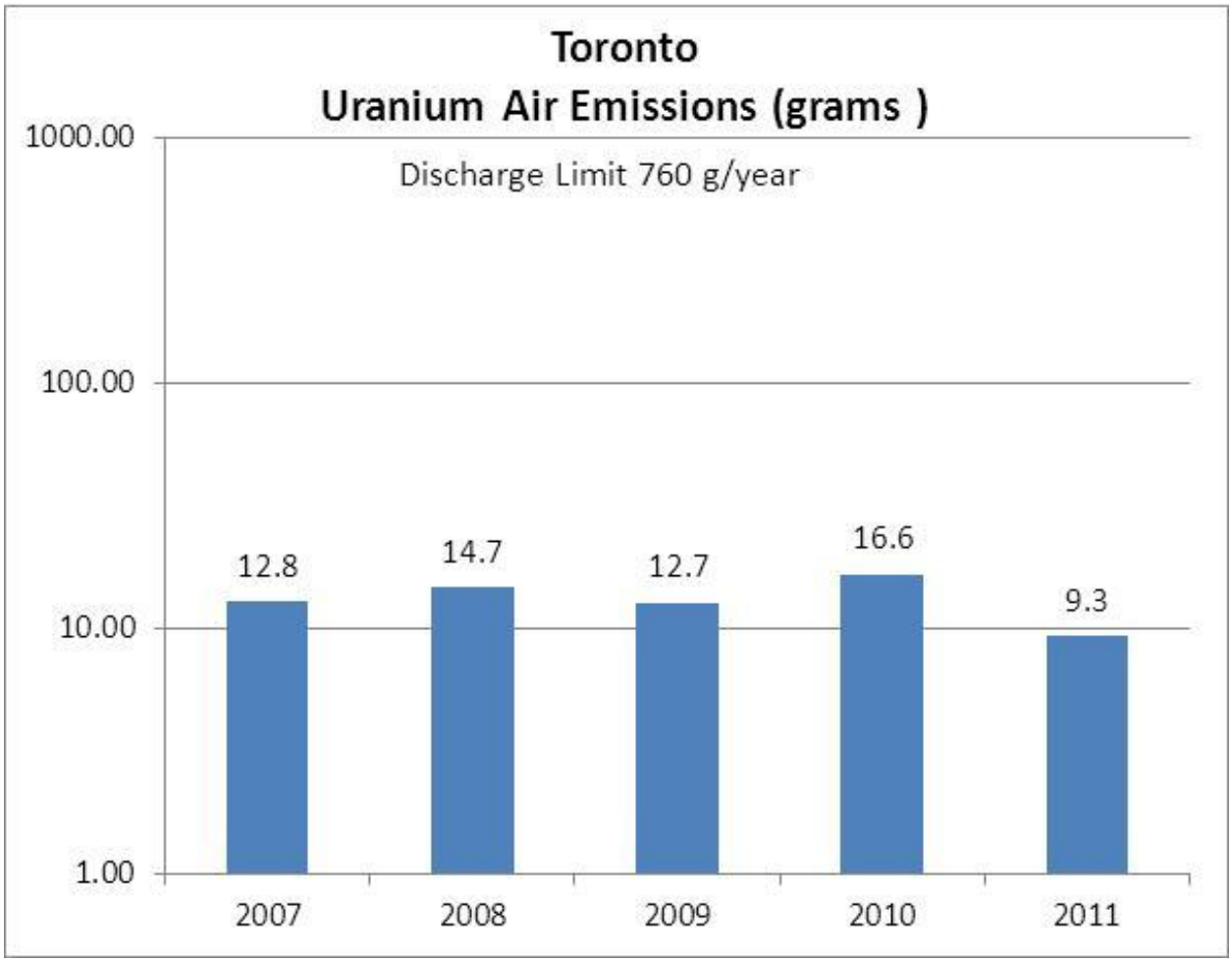

Figure 8: Toronto Air Emission Trending

Note: the above graph has a logarithmic scale

The Toronto air emission trend up until 2010 was fairly flat, i.e. within the range of measurement uncertainties. However, there is a noted decreasing trend year over in 2011. This is likely due to upgrades completed in 2010 to the rotoclone system including:

- Installation of a drain-pan and insulation to reduce condensation along with a recurring regular task to drain water
- Implementation of a recurring regular task to clean part of the duct work
- Semi-annual MP2 task to clean Hopper and Baffles

6.7.2 Water Effluent Monitoring

The primary hazardous liquid effluent from the GEH-C Peterborough facility is uranium dioxide in water that is from washing floors and walls in the uranium pellet loading and end closure weld area. This water is collected in a 205 litre (45-Imperial gallon) drum and is filtered prior to sampling.

After the water sample is verified to be below the *Action Level* of 6 ppm (per batch) the wash water is filtered again during discharge to the sanitary sewer. The GEH-C Plant sewer also receives other wastewater from the non-nuclear fuel operations resulting in increased dilution prior to discharge to city sewers. Total grams are measured prior to additional filtering and dilution during discharge.

In Toronto, bulk quantities of UO_2 powder are handled. This requires frequent cleaning and washing, creating higher concentrations of uranium in wastewater to be treated. The water is used to clean protective clothing, walls, and floor and in various other janitorial functions. The water is treated to remove uranium dioxide and the concentration of UO_2 in waste water leaving the treatment system is measured. The concentration of UO_2 in the total waste water leaving the plant premises is calculated. Water volumes are based on metered usage rates.

The water effluent treatment system at the Toronto facility operates as follows:

1. Waste water is held in batches
2. Each batch is treated, then sampled
3. Each batch is only released when sample results confirm the concentration is less than 3 ppm (note: the Action Level for a batch is 6 ppm)
4. The released water mixes with sanitary water
5. Dilution factors range from 4 to about 12; the resulting volume discharges to a combined sanitary/storm city sewer
6. Reported results do not include dilution, i.e., sample measurements are taken prior to mixing with non-process water

Results from 2011 water effluent monitoring are summarized in the Table below. Annual discharges are trended in Figure 9: Peterborough Water Emission Trending and Figure 10: Toronto Water Emission Trending.

	Peterborough	Toronto
Total Amount of Liquid Discharged (L)	1435	1,302,170
Highest Uranium Concentration in Water (ppm)	0.21	2.75
Average Uranium Concentration in Water (ppm)	0.10	1.28
Number of Samples Exceeding Action Level (6 ppm per batch)	0	0
Total Uranium Discharge to Sewer (g)	0.14	1050

Table 14: Liquid Effluent Monitoring Results

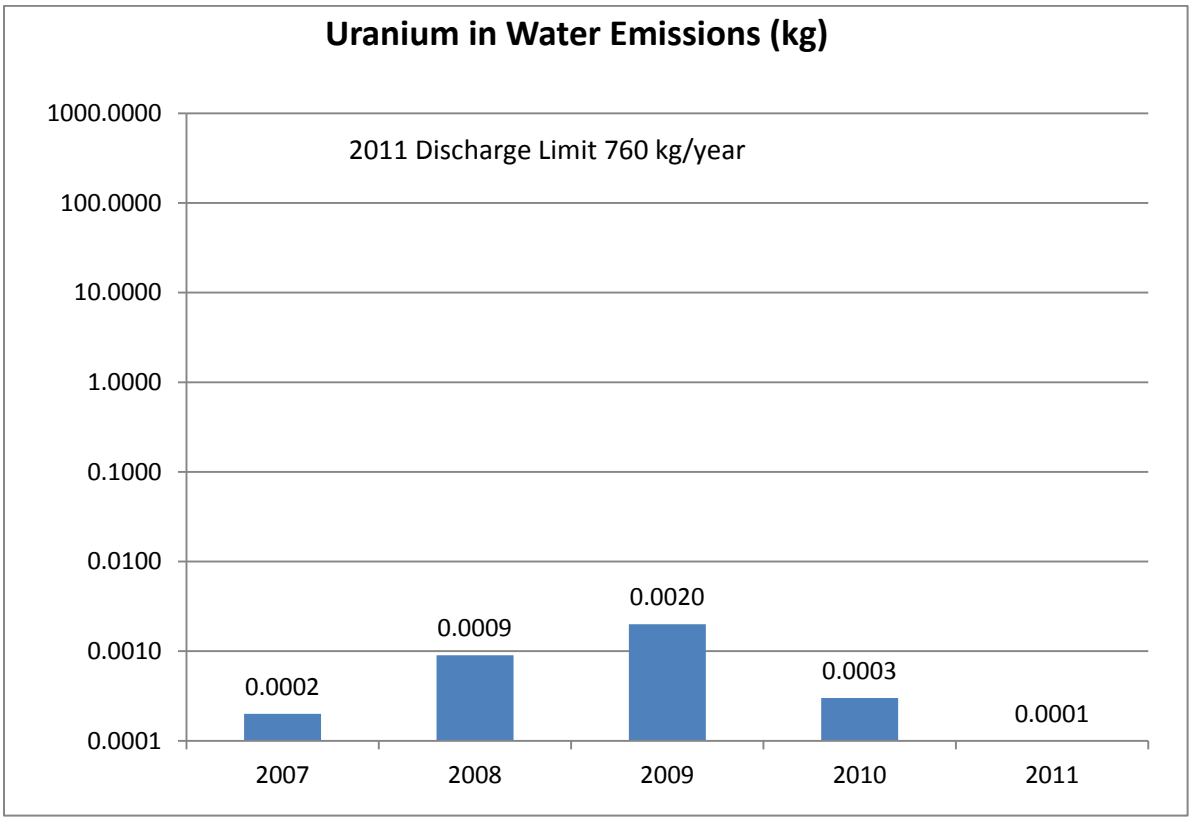

Figure 9: Peterborough Water Emission Trending

Note: the above graph has a logarithmic scale

In Peterborough, water release results continue to remain low and below the Action Level of 3 ppm (annual average). Doses to the general public as a result of liquid releases continue to remain negligible.

The total release of 0.14 g in 2011 is a very small fraction of the derived emission limit and of the new discharge limit of 760 kg/year. It therefore represents a negligible dose to a member of the public.

The five year trend graph of water releases shows a fairly stable five year performance consisting of low water releases. The sample batch number size is limited and trending is difficult due to small random fluctuations in low concentrations.

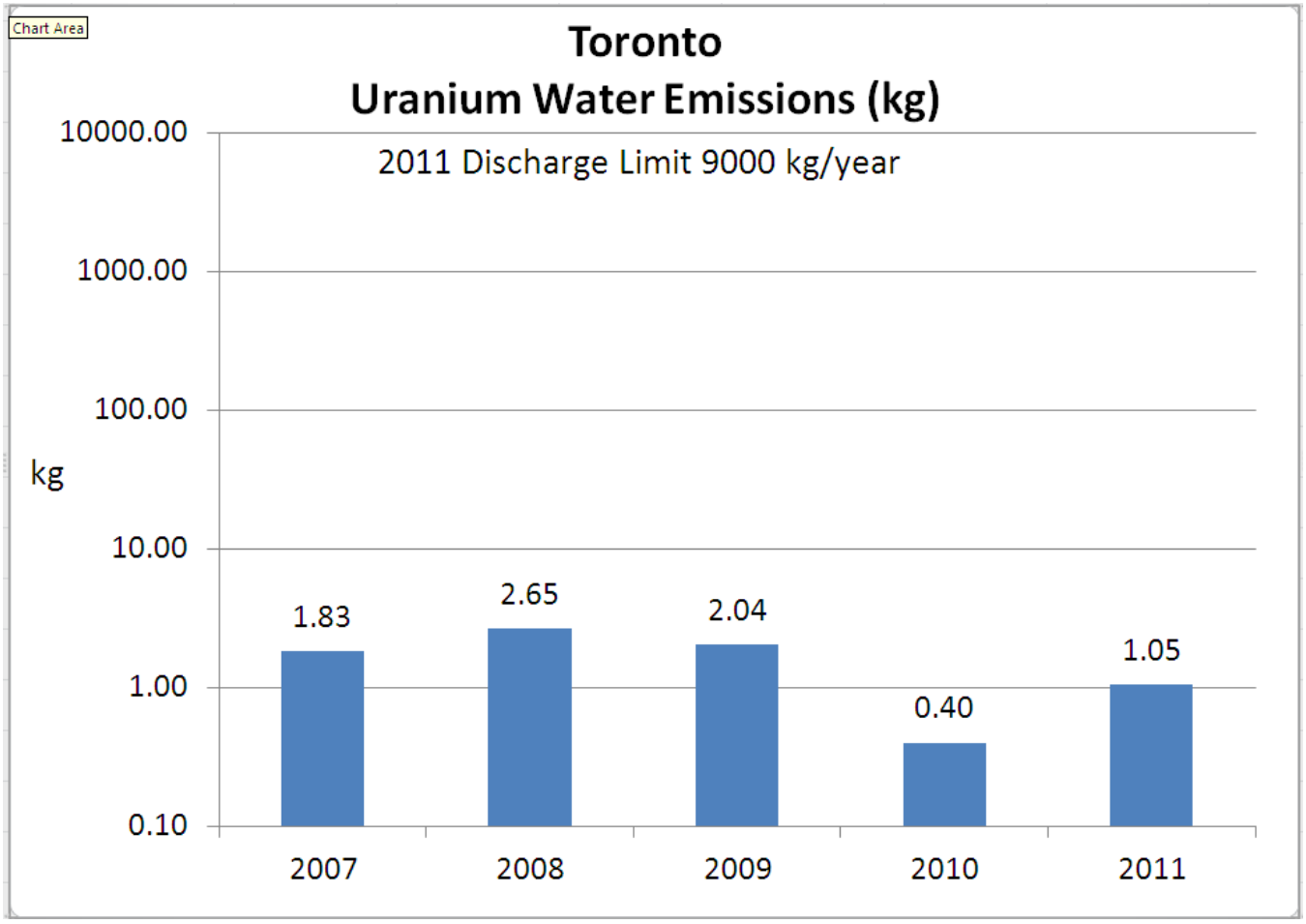

Figure 10: Toronto Water Emission Trending

Note: the above graph has a logarithmic scale

The short term, Toronto water release trend is increasing. Overall, liquid effluent releases are trending downward.

In 2009 a six sigma project to drive down water releases in accordance with the ALARA principle was initiated. Upgrades included a water waste characterization study. They also included an optimization of water mixing and treatment processes and reduction in the internal control level, which together reduced the average concentration of each batch and also the discharge quantity. In 2011 however, the facility saw a higher source term which was due to a higher decontamination load and grinder wash water output in 2011.

6.7.2.1 Exceedances of Regulatory Limits or Action Levels

No action levels or regulatory limits were exceeded during the reporting period.

6.7.2.2 Environmental Protection Program Effectiveness

GEH-C's Peterborough and Toronto facilities are registered to ISO14001:2004. As part of the requirement for maintaining ISO14001 registration an Environmental Management System (EMS) is in place. Our Environmental Management System meets the requirements of both ISO14001 and GE's internal 6 Element E-Framework.

Internal inspections are completed on a routine basis and focus on all areas of the plant. The purpose of these inspections is to identify Environmental and Safety issues. Workplace Safety Committee members carry out monthly plant safety and environmental inspections. After an inspection, the inspection findings are documented, corrective actions identified, and submitted to applicable personnel. Depending on the complexity of the finding immediate action may be required (i.e. equipment shutdown), or the action may be incorporated into meeting minutes, or tracked in GEH-C's Action Tracking System.

The following audits of the environmental protection program are conducted at each facility:

- The EMS is audited internally every year as per ISO14001:2004
- The EMS is audited externally (by QMI-SAI Global) every year as per ISO14001:2004
- An annual self-assessment is conducted for each of the 6 E-framework elements

Following an audit, the findings are documented, corrective actions identified and tracked to completion in GEH-C's Action Tracking System.

In 2011, there were 9 environmentally related audit findings for Peterborough and 5 for Toronto. All were closed within 60 days of the finding.

6.7.2.3 Environmental Protection Program Improvements

No significant changes or improvements were made to the Peterborough environmental protection program.

In Toronto, there were several noise reduction projects completed. A grinder wash water treatment unit and additional filtration were added in 2011. The impact to water release trends will be closely monitored in 2012.

6.7.2.4 Environmental Protection Program Performance

2011 goals are summarized in the Table below.

	Goal Description	Goal Achieved
Peterborough	Water Usage reduced by 5% over 2010	Usage reduced approximately 3% over 2010
	Solid Waste Generation reduced by 5% over 2010	No solid waste reduction achieved over 2010
	Reduce the power consumption by 10,000 kwh over 2010.	Approx. 6,000 kwh reductions were achieved
	100% completion of regulatory and non-regulatory training	100% completion achieved
Toronto	All release concentrations below 2.5 ppm over 2010	Met
	Solid Waste Generation reduced by 5% over 2010	Met
	Reduce the power consumption by 1000 kwh over 2010.	Not met
	100% completion of regulatory and non-regulatory training	Met

Table 15: EMS Program 2011 Goals

The following Peterborough EMS goals have been set for 2012:

1. Reduce water usage by 5% over 2011
2. Waste diversion rate increased by 5% over 2011
3. Reduce power consumption by 5,000 kWh over 2011
4. 100% of regulatory and non-regulatory training completed
5. 100% of emergency drills held

The following Toronto EMS goals have been set for 2012:

1. Solid Waste Generation reduced by 5% over 2010
2. 30% reduction in waste inventory (as of January 2012)
3. No reportable spills or releases
4. Average water effluent tank releases less than 1.0 part per million
5. Reduce the power consumption by 1000 kWh/year
6. Environmentally friendly substitution of two products

6.7.2.5 Well and Soil Sampling Measurements/Monitoring

Well monitoring is not conducted at either facility. Soil sampling is not conducted at the Peterborough facility due to the negligible release amounts.

Soil sampling is conducted annually at the Toronto facility. Samples are retrieved from 49 locations and analyzed externally by delayed neutron activation for the amount of natural uranium in parts per million and compared to the previous year's results. Results from 2011 are summarized in the table below.

	Result
Highest Uranium Concentration (ppm)	14.8
Average Uranium Concentration (ppm)	2.3

Table 16: Toronto Soil Sampling Result Summary

6.8 Emergency Management and Response

6.8.1 Review of Emergency Preparedness Program Activities

Emergency drills in Peterborough were performed in the following areas:

- Medical (twice)
- Chemical Spill (once)
- Evacuation (twice)
- Hazardous materials transportation (once)

Emergency drills in Toronto were performed in the following areas:

- Fire (twice)
- Medical (once)
- Transportation (once)

6.8.2 Emergency Preparedness Training Program and Effectiveness

The Peterborough Emergency Response Team was trained on fire extinguishers, first aid/cardio-pulmonary resuscitation/automatic external defibrillator, blood-borne pathogens and emergency spill response. Training course completion is summarized in the Table below.

Course Name	Number of Employees who Required Course	Number of Employees who Completed Course
Emergency Preparedness and Fire Prevention (Initial)	39	39
Emergency Preparedness and Fire Prevention (Refresher)	264	263 (1 in early 2012)
Portable Fire Extinguisher Training (Practical)	12	12
Portable Fire Extinguishers	328	328
Spill Response (Practical)	12	12
Blood borne Pathogens Awareness (Initial)	5	5
Blood borne Pathogens Awareness (Refresher)	6	6
First Aid	5	5

Table 17: Emergency Preparedness and Fire Prevention Training Summary

6.8.3 Fire Protection Program Activities and Effectiveness

An internal compliance audit is conducted annually at each site, as well as a self-assessment to GE's Health and Safety Framework requirements.

In Peterborough, two actions were issued as a result of the internal compliance audit related to a container type and a third requiring an update of the emergency response assistance plan. Twenty-two actions resulted from GEH-C routine internal site inspections. Two third-party audits were conducted related to the fire protection plan which resulted in one action relating to supervisory monitoring of valve to standpipe and supervision of sprinkler flow switches in building 26.

In Toronto, one action was issued as a result of the internal compliance audit regarding the emergency call tree. Three third party audits were conducted in Toronto, which resulted in seven actions resulting in some assessments, procedural improvements and new fire extinguisher locations. One action resulted from the ISO 14001 external audit regarding the extension of a wall in the press feed area. One action resulted from an EHS inspection and employee concern regarding flammable materials near zirconium machining.

Internal Fire Protection Inspections are performed as per the National Fire Code, 1995.

In Peterborough, twenty-six Action Tracking System items were raised in 2011 in regards to Emergency Response and Fire Protection. Seven items remain open.

In Toronto, ten Action Tracking System items were raised in 2011 related to Emergency Response and Fire Protection. All items are closed.

6.8.4 Fire Protection Program Improvements

In Peterborough, two new emergency evacuation stations were added to Building 26 and two additional alarm bells. A fire separated lift truck storage area in building 24 and a fire separation at the south end of Building 24 North were constructed.

No changes were made to the Toronto program.

6.9 Waste and By-Product Management

Waste and by-product management is described and summarized in Appendix C, sent to the CNSC under separate cover.

6.10 Nuclear Security

Nuclear Security is described and summarized in Appendix D, sent to the CNSC under separate cover.

6.11 Safeguards and Non-Proliferation

In Peterborough, a short notice random inspection conducted by the International Atomic Energy Agency (IAEA) was conducted on March 11, 2011. Physical inventory verification was conducted by the IAEA and the CNSC on July 11, 2011. There were no findings or major concerns noted.

In Toronto, physical inventory verification was conducted by the IAEA and the CNSC on July 14, 2011. A short notice random inspection conducted by the IAEA was conducted on November 25, 2011. There were no findings or major concerns noted.

6.12 Packaging and Transport of Nuclear Substances

Shipments to and from both facilities was conducted safely and in accordance with regulations.

A self-assessment in Peterborough revealed an opportunity to improve completion of waste manifests, which are now completed by the EHS department. A related internal Radiation Protection audit was also conducted which required a review of packaging, acceptance and labeling on shipment and receipt and resulted in procedural improvements.

A self-assessment in Toronto revealed that the Emergency Response Assistance Plan required updating with new contact information. An internal compliance audit revealed a review of sample preparation for shipment was reviewed in light of an incident at another Class 1B facility resulting in the spread of contamination.

These items were tracked to completion within the 60 day time-frame in the GEH-C Action Tracking System.

6.13 Other Matters of Regulatory Interest

6.13.1 Public Information Program

As part of its Public Information Program (PIP), GEH-C updated the information pamphlet for each of the Peterborough and Toronto facilities to include data for 2010. This pamphlet was made available at the facilities as well as on the GEH-C PIP web page. The web page was updated to include Annual Compliance Reports for 2010 and an updated EHS Mission Statement. The web page was also updated with information about the 10-year renewal and consolidation of the Toronto and Peterborough licenses into a single licence, and information regarding the bomb threat event on September 16th 2011 at the larger GE Peterborough facility.

Media coverage for both facilities was monitored. Media coverage of GEH-C operations was minimal with the exception of coverage of the bomb threat event at the Peterborough facility which included reporting by local print, radio and television media. GEH-C responded to media inquiries in relation to that event.

GEH-C participated at a meeting at the Prince of Wales school in May, providing information on our operations to parents and teachers.

6.13.2 Site-Specific

6.13.2.1 Nuclear Criticality

GEH-C does not have an active Nuclear Criticality Program since neither facilities process enriched uranium. This section is not applicable.

6.13.2.2 Financial Guarantee

In 2011 a revised preliminary decommissioning plan was submitted to the CNSC for both facilities.

The primary changes were the inclusion of external management fees in the plan and consolidating all relevant information (from the original preliminary decommissioning plan and subsequent updates) into a standalone plan.

The cost estimate increased and a revised financial guarantee was secured and submitted to the CNSC along with the updated plan.

6.13.3 Improvement Plans and Future Outlook

Operational changes planned for 2011 are summarized in Appendix C, submitted to the CNSC under separate cover.

6.13.4 Objectives for the Following Year

Facility operations are expected to remain fairly constant in 2012. Fuel production levels are projected to be similar to the amount processed in 2011. No significant changes are currently forecasted for either the Fuel or Services operations. The facility operating licence remains valid until 2020. As no significant changes are expected, no licence document submissions or changes are expected.

7 CONCLUDING REMARKS

This compliance report demonstrates that GEH-C has successfully met the requirements of the Nuclear Safety and Control Act, Regulations and CNSC licence requirements.

In summary, whole body, skin and extremity dose measurement results for employees in uranium handling areas were all below regulatory limits and GEH-C *Action Levels*. Environmental emission results were all below GEH-C *Action Levels*. Annual releases to the water and air were both a very small fraction of regulatory limits. In 2011, all production limits were respected. There were no significant issues or incidents encountered. There were no CNSC reportable events.