

ILLINOIS POLLUTION CONTROL BOARD  
May 1, 2008

IN THE MATTER OF: )  
)  
PROCEDURES REQUIRED BY P. A. 94-849 ) R07-20  
FOR REPORTING RELEASES OF ) (Rulemaking - Water)  
RADIONUCLIDES AT NUCLEAR POWER )  
PLANTS: NEW 35 Ill. Adm. Code 1010 )

Adopted Rule. Final Notice.

OPINION AND ORDER OF THE BOARD (by G.T. Girard):

Pursuant to P.A. 94-849, the Illinois Environmental Protection Agency (Agency) proposed rules for prescribing standards for detecting and reporting unpermitted releases of radionuclides from nuclear power plants. The Board has held two hearings and accepted comments on the proposal. On December 6, 2007, the Board proposed for first notice the rule as proposed by the Agency, with only minor changes. The rule was published in the *Illinois Register* on December 21, 2007. *See* 31 Ill. Reg. 16685 (Dec. 21, 2007). The Board received no additional comment and held no additional hearings during first notice. On March 6, 2008, the Board filed the rule for second notice with the Joint Committee on Administrative Rules (JCAR). JCAR voted a certificate of no objection on April 15, 2008, and suggested no changes. Therefore, the Board will adopt the rule for final notice today.

The Board's opinion opens with procedural history, background, and a summary of the rule. Next, the Board summarizes the testimony and comments in the record. Finally, the Board will discuss the reasons for adopting the rule for final notice.

**PROCEDURAL HISTORY**

On May 25, 2007, the Agency filed a proposal as required by Section 13.6(e) of the Environmental Protection Act (Act) (415 ILCS 5/13.6(e) (2006)). The proposal included a 10-page statement of reasons (Reasons). On June 21, 2007, the Board accepted the rulemaking for hearing.

On July 13, 2007, in accordance with Section 27(b) of the Act (415 ILCS 5/27(b) (2006)), the Board requested that the Department of Commerce and Economic Opportunity (DCEO) conduct an economic impact study for this rulemaking. On August 7, 2007, the Board was informed that the DCEO had decided not to conduct an economic impact study for this rulemaking. At the public hearing held on October 10, 2007 (Tr.2), the Board solicited comments on DCEO's decision not to conduct an economic impact study. No comments were offered. Tr.2 at 5-6.

On August 24, 2007, the Board has received pre-filed testimony from Zigmund Karpa on behalf of Exelon Nuclear (Exelon) (Exh. 3) and Richard Cobb on behalf of the Agency (Exh. 1).

The Board held two hearings in this proceeding before Hearing Officer Marie Tipsord. The first hearing was held on September 5, 2007, in Chicago (Tr.1) and the second October 10, 2007, in Springfield (Tr.2). At those hearings the Board heard testimony from:

Kyle Rominger and Richard Cobb on behalf of the Agency;  
Zigmund Karpa on behalf of Exelon.

At the close of hearings a November 1, 2007 deadline for public comments to be filed was set. The Board has received two public comments in this matter, both from the Agency (PC 1, PC 2).

On December 6, 2007, the Board adopted the rule for first notice. The proposed rule was published in the *Illinois Register* on December 21, 2007. The Board received no additional public comment and no requests for additional hearings. Therefore, on March 6, 2008, the Board proceeded to second notice and filed the rule with JCAR. JCAR issued a certificate of no objection on April 15, 2008, and suggested no changes to the rule.

### **BACKGROUND**

The Agency submitted this proposed rulemaking pursuant to P.A. 94-849 that added Section 13.6 to the Act (415 ILCS 5/13.6 (2006)). Reasons at 1. Section 13.6 required the Agency, in consultation with the Illinois Emergency Management Agency (IEMA), to “propose rules to the Board prescribing standards for detecting and reporting unpermitted releases of radionuclides.” 415 ILCS 5/13.6(e) (2006). Section 13.6 further requires “the detection and reporting of unpermitted releases of any radionuclides into the groundwater, surface water, or soil at nuclear power plants, to the extent that federal law or regulation does not preempt such requirements.” 415 ILCS 5/13.6(a) (2006). Section 13.6 requires that “[w]ithin 24 hours after an unpermitted release of a radionuclide from a nuclear power plant, the owner or operator of the nuclear power plant where the release occurred shall report the release to the Agency and the Illinois Emergency Management Agency.” 415 ILCS 5/13.6(c) (2006).

Section 13.6 was added to the Act following a series of leaks of tritiated water at the Braidwood Nuclear Power Station (Braidwood Station) in Will County, Illinois. Reasons at 2. The tritium leaks resulted in groundwater contamination and impacted a nearby residential well. *Id.* A number of other nuclear power plants had also experienced tritium leaks, which resulted in groundwater contamination. *Id.*

The Agency consulted with the Interagency Coordinating Committee on Groundwater (ICCG), the Groundwater Advisory Committee (GAC), and IEMA following the passage of P.A. 94-849 in order to develop these rules. Reasons at 3. The Agency also worked with Exelon Corporation (Exelon) while developing the proposed rules. *Id.* Exelon owns and operates all of the nuclear power plants in Illinois, either itself or through related entities. *Id.* The Agency also considered feedback on the proposed rules from the GAC-hosted stakeholder outreach meeting, to which state and federal legislators, representatives of local government, representatives of IEMA, the Nuclear Regulatory Commission (NRC), Exelon, the American Medical Association, and nuclear and environmental interest groups were invited. Reasons at 3-4.

### **SUMMARY OF THE RULE**

The rule includes procedures for reporting releases of radionuclides at nuclear power plants. The procedures will allow licensees of power plants to fulfill their obligation under Section 13.6 of the Act (415 ILCS 5/13.6 (2006)) to report unpermitted releases of radionuclides to the Agency and Illinois Emergency Management Agency (IEMA). These procedures establish a requirement that within 24 hours of any unpermitted release of radionuclides into the groundwater, surface water, or soil, the licensee must evaluate the release to determine whether it needs to be reported and, if reporting is necessary, make a report to the Agency and IEMA within that same 24 hours. *See* Section 1010.200. The rule gives the proper procedure for reporting the releases, including the appropriate reporting phone numbers for the Agency and IEMA as well as instructions on electronic reporting. *See* Section 1010.202. The rule further requires a follow-up written report be sent to the Agency and IEMA within five days after reporting the release. *See* Section 1010.204. This follow-up report must contain the information required for the initial report as well as supplemental information on the release utilizing the best data available. *Id.*

Under the rules, a radionuclide is deemed to have been detected if an unpermitted release of liquids either: 1) results in tritium concentrations of 200 picocuries per liter (pCi/L) or more outside the licensee controlled area, or 2) contains tritium at quantities of 0.002 Curies (Ci) or more. PC 2 at 2.

Tritium is a radionuclide that is a natural byproduct of electricity production in nuclear power plants. Exh. 1 at 3. Tritium is also naturally produced in the atmosphere when cosmic rays collide with air molecules. *Id.* Naturally occurring tritium is found in trace amounts in groundwater worldwide. *Id.*

Based upon information from the Braidwood station, the background level for tritium is 35 pCi/L. However, in commercial, State, and private laboratories (other than research laboratories), the lowest amount of tritium that can be practically detected is 200 pCi/L. That is why the reporting levels for this rule are 200 pCi/L. PC 2 at 3. The quantity of 0.002 Ci as another reporting requirement is a practical level. Exelon's staff is familiar with this level and it can be determined without analytical testing. PC 2 at 4. Releases of quantities of less than 0.002 Ci are not expected to result in concentrations of 200 pCi/L of tritium or more outside the licensee controlled area. *Id.*

These provisions of the rules are uniform across all contaminant sources and all geographic areas within the State. PC 2 at 4. These provisions do not apply outside Illinois, nor do they make special provision for alert and abatement standards and procedures respecting occurrences, emergencies of pollution or other short-term conditions constituting an acute danger to health or the environment, or regulations specific to individual persons or sites. PC 2 at 4-5.

### **SUMMARY OF TESTIMONY**

Below the Board will summarize the testimony from the hearings in this proceeding. The Board will first summarize the Agency's testimony and then Exelon's testimony.

### **Agency Testimony**

The Board will summarize the testimony of the Agency's primary witness, Richard Cobb. Then the Board will summarize the testimony of Kyle Rominger.

#### **Richard Cobb**

Mr. Cobb's testimony spoke to the purpose and background of the regulations, a summary of the releases that lead to the new regulations, as well as explaining each section of the proposed regulations in turn. The following paragraphs will summarize each section of his testimony.

**Purpose of the Rulemaking.** According to Mr. Cobb, the purpose of the Agency's proposed regulations is to establish requirements for the owners and operators of nuclear power generating facilities to fulfill their obligation under Section 13.6 of the Act (415 ILCS 5/13.6 (2006)) for reporting releases of radionuclides to soil, groundwater, or surface water to the Agency and IEMA. Exh. 1 at 1. Mr. Cobb also testified that the purpose of "this regulation is not to set standards for radionuclide releases, but to merely establish requirements for reporting a release of radionuclides." *Id.*

**Background.** Mr. Cobb stated that these proposed regulations can be traced back to three groundwater contamination incidents at the Exelon nuclear power generating facilities located in: Dresden, Grundy County; Braidwood, Will County; and Byron, Ogle County. Exh. 1 at 2. The contamination at Dresden resulted from numerous leaks from underground piping, which contaminated the groundwater with tritium. Exh. 1 at 3. At Braidwood, water mixed with tritium was released from a vacuum breaker, through a blowdown line, and into the Kankakee River. Exh. 1 at 2. The Byron contamination involved internal inspections at the plant, which reported standing water containing tritium that was found in six concrete vacuum breaker vaults in the ground that are part of the blowdown line running to the Rock River. Exh. 1 at 7. Though Exelon monitoring wells showed tritium, independent testing of drinking water wells at nine homes closest to the property line showed no signs of tritium. *Id.*

**Summary of Releases.** The release at Braidwood station involved approximately three million gallons of tritiated wastewater released from a blowdown line in 1998, causing a groundwater contamination plume. Exh. 1 at 3. The release at the Braidwood Station reached as high as 20,000 pCi/L. *Id.* Mr. Cobb states that the background concentration of tritium at Braidwood was found at 35 pCi/L using an enriched tritium testing method to test the waters in a cooling water pond on site. Exh. 1 at 4. However, Mr. Cobb testified that enriched tritium tests are primarily used only in research laboratories due to their costs and technical requirements. *Id.* Mr. Cobb further testified that 200 pCi/L is the practical qualification limit (PQL) for tritium, the lowest concentration or level that can be reliably measured with 95 percent confidence in the value. *Id.* Mr. Cobb also testified that the Agency believes the use of 200 pCi/L is a more appropriate standard to use for reporting releases, because Exelon, IEMA's Division of Nuclear Safety, and other commercial laboratories can readily perform testing to this level. *Id.*

The unpermitted release of tritiated water from the Dresden station in 2004 was discovered when concentrations of tritium in the range of 3,000,000 to 6,000,000 pCi/L were detected in monitoring wells that had been installed following a previous release in 1994. Exh. 1 at 5. Mr. Cobb testified that according to Exelon officials, the highest concentration of tritium found on the site was 20,000,000 pCi/L. *Id.* According to Mr. Cobb, Exelon investigations found that the tritium contamination originated from a release in a condensate storage tank system through a pipe that passed under a liquid nitrogen tank. *Id.*

**Agency's Proposed Rule.** The following paragraphs will summarize Mr. Cobb's testimony in support of the specific rule language proposed by the Agency.

**Section 1010.200 Evaluation of Releases.** Mr. Cobb testified that Section 1010.200 contains the key thresholds for detecting and reporting releases of tritium that may cause, threaten, or allow degradation of surface or groundwater resources beyond the licensee's boundary area. Exh. 1 at 7. The proposed off-site reporting threshold for tritium is based on the PQL of 200 pCi/L. According to Mr. Cobb, this measure is used in the existing Board's preventative notice and response provisions of 35 Ill. Adm. Code 620.305 and 620.310 and is a measure reasonably achieved in commercial, State, and private laboratories. Exh. 1 at 8. Mr. Cobb further testified that the Agency and Exelon are in agreement with this threshold. *Id.* Mr. Cobb also stated that tritium is being used for reporting because it is the only radionuclide being found. *Id.*

Mr. Cobb went on to testify that a level of 0.002 Ci of tritium is the suggested level for on-site reporting. Exh. 1 at 8. Releases of quantities of less than 0.002 Ci are not expected to result in concentrations of 200 pCi/L of tritium or more outside the licensee controlled area, making it a quality indicator of when reporting is necessary. *Id.* According to Mr. Cobb, the Exelon staff is familiar with this measure and can report it rapidly upon occurrence rather than waiting for analytical tests. *Id.* Mr. Cobb explained that in determining whether a 0.002 Ci on-site standard would be sufficiently conservative to predict if 200 pCi/L would be exceeded beyond the licensee controlled area, a groundwater fate and transport model was used (BIOSCREEN *see infra* 6).

**Groundwater Principles.** Mr. Cobb testified that water entering the soil may evaporate, or be used by plants and transpired. Exh. 1 at 9. The rest of the water travels down through pore spaces until reaching the "water table," which is the zone where all pore spaces are filled. *Id.* The height of the water table is determined by measuring the elevation of water in wells that are dug into the saturated zone. *Id.* Usually, the surface of the water table will rise and fall along with the overlying land surface, but in a more subtle and smoother fashion. *Id.* The water table can intersect with the ground surface in certain places creating lakes, perennial streams, and springs, which are natural areas of groundwater discharge. *Id.* Mr. Cobb further explained that while gravity makes surface water move downhill, groundwater moves downhill from areas of higher potential energy to areas of lower potential energy, moving toward areas that are less filled with water. *Id.*

The area where infiltration occurs is called a recharge zone and the area where groundwater discharges into streams or lakes is called the discharge zone. Exh. 1 at 9.

According to Mr. Cobb, groundwater movement can be estimated using a map that shows the elevations of the water levels in observation wells. Generally, the water flow will run perpendicularly to the contours of the map. *Id.* The rate of groundwater movement is related to the permeability of the aquifer and the slope of the potentiometric surface. *Id.*

When measuring groundwater flow, “hydraulic conductivity” is used instead of permeability and is a function of the size and shape of pore spaces, the degree of interconnection of the spaces, and the type of fluid passing through the medium. Exh. 1 at 9. As a water-soluble contaminate migrates hydrologically through a groundwater field, its concentration will tend to decline progressively due to dilution, retardation and transformation. Exh. 1 at 11. With a release of tritium, mixture with uncontaminated groundwater will dilute the tritium contaminated water as it moves along. *Id.*

**Modeling Approach.** Mr. Cobb testified regarding the modeling approach that the Agency used to determine whether a 0.002 Ci on-site standard would be sufficiently conservative to predict if 200 pCi/L would be exceeded beyond the licensee controlled area. Mr. Cobb stated that first a hypothetical source of tritium contamination was identified for each site, representing a nuclear generating station. Exh. 1 at 11. The BIOSCREEN modeling system was then used to determine whether a 0.002 Ci on-site standard would be sufficiently conservative to predict if 200 pCi/L would be exceeded beyond the licensee controlled area. Exh. 1 at 12. Mr. Cobb also testified that the models used represented “conservative” or “reasonable worst case” scenarios. Exh. 1 at 13. Mr. Cobb identified three basic objectives in this modeling approach:

- 1) Determine if a release of 0.002 Ci of tritium from a representative source at a nuclear generating station would migrate off-site;
- 2) Predict the migration of the tritium in groundwater with respect to the licensee controlled area, and with respect to adjacent properties and water bodies; and
- 3) Use the modeling results to calculate leakage rates and associated concentrations (e.g., 0.71 gallons per minute and 17,248 pCi/L) to determine if they are realistic. *Id.*

The modeling scenario, according to Mr. Cobb, assumed that a release of tritiated water would occur most commonly in buried pipes and would be discovered within 30 days. Exh. 1 at 13. 30 days was used because, according to Mr. Cobb, with Exelon’s monthly integrity tests of underground piping and blown down lines as well as real time moisture sensors in VB vaults, no leak should go undetected for more than 30 days. Exh. 1 at 14.

Mr. Cobb explained that this system was used to model a contamination at the Braidwood station using a hypothetical release of 30,633 gallons of tritiated water, which equals a concentration of 17,248 pCi/L for 30 days. Exh. 1 at 14. The simulation showed that the plume would move approximately 595 feet in 237 days and the concentration of tritium in the water would be reduced to 200 pCi/L at that distance via dispersion. Exh. 1 at 15. Braidwood was used as the example because, as Mr. Cobb testified, the Agency knows how Braidwood’s

hydrogeologic susceptibility varies as compared to the other Exelon facilities and so it can be useful as a reference point. Exh. 1 at 16. According to Mr. Cobb, this information is helpful to the Agency because it shows that with an estimated mass of tritium being released from an underground pipeline or waste water conveyance, in a setting more or less susceptible than Braidwood, the Agency can know what the potential fate and transport will be at distances more than or less than 595 feet. *Id.*

Mr. Cobb concluded his explanation of the modeling approach by explaining that the modeling results, combined with knowledge regarding Exelon's stations show that 0.002 Ci is a conservative reporting threshold for on-site releases of tritiated water. Mr. Cobb further explained that Exelon's detection monitoring program will act as a backup to the occurrence based detection on site. Exh. 1 at 17.

**Section 1010.202 Reporting Releases.** According to Mr. Cobb, this Section controls the form and format of how releases must be reported to the Agency and IEMA. Exh. 1 at 17. Mr. Cobb testified that the Agency duty officers and first responders have established communication protocol with IEMA and the State Emergency Operations Center, which uses cellular phones, satellite technology through smart phones, and other wireless devices. Exh. 1 at 17-18.

**Section 1010.204 Follow-up Written Report.** This section requires a follow-up written report to the initial rapid response report. Exh. 1 at 17-18. This report will clarify and supplement information in the rapid response report, granting greater information to the public and providing a practical bridge to the Right-to-Know provisions of the Act (415 ILCS 5/25(d) (2006)), and the Board's Community Relations Activities Performed in Conjunction with Agency Notices of Threats from Contamination (35 Ill. Adm. Code 1600). *Id.*

**Response to Questions.** When asked how Exelon will find out if there has been a release and how they will go about the detection and reporting process, Mr. Cobb testified that there is a visual inspection that is done of blowdown lines or other areas where releases have occurred in the past. Tr.1 at 15. The Agency along with IEMA, and the Department of Nuclear Safety Inspectors are conducting quarterly inspections to assure that the proper inspections are being done on site. Tr.1 at 15-16. There is also 24 hour a day on-site personnel from IEMA and the NRC. Tr.1 at 16. Mr. Cobb further testified that the real time sensors for detecting moisture in vacuum breakers as well as a complex set of groundwater monitors act as backups to the visual monitoring. Tr.1 at 17. If releases are detected through these systems, an alarm will be triggered so staff will know to go inspect the situation. *Id.*

Mr. Cobb went on to state that calculations of releases by on-site inspectors can be done because the inspectors generally know the pCi/L concentrations because they have the NRC permit that regulates the concentration and the inspectors have been trained to be "pretty accurate" concerning the number of gallons released. Tr.1 at 19. So when a release is detected, the inspector can visually estimate the number of gallons released and calculate the amount of tritium released according to the pCi/L concentrations in the NRC permit. *Id.*

When asked whether the rule language should include a distinct subpart or section addressing the detection of releases, Mr. Cobb testified that the detecting portion is included in

the evaluation of releases. Tr.1 at 12. According to Mr. Cobb, ongoing monitoring programs are beyond the scope of Section 13.6 of the Act (415 ILCS 5/13.6 (2006)). Tr.1 at 13. Mr. Cobb believes that the rules are clear that the detection is built into the evaluation process. *Id.* Mr. Cobb also pointed out that analytical methods for detection are already present in Part 611.101 of the Board's regulations and are incorporated by reference in 35 Ill. Adm. Code 620, the Groundwater Quality Standards. *Id.* Mr. Cobb testified that by estimating the mass and calculating a concentration in pCi/L immediately without waiting for a laboratory to do the work, this detection method will be more preventative in nature than a method which relies on gathering samples and sending them to a laboratory. Tr.1 at 14.

Mr. Cobb testified that the Agency's position is that the monitoring requirements should not be in the rules because the monitoring programs that are in place coupled with the inspection programs are all that is needed. Tr.1 at 22-23. Mr. Cobb then again emphasized that the groundwater monitoring system that is in place is only a back up to the visual inspection and monitoring program that is ongoing. Tr.1 at 25. Mr. Cobb also testified that the inspection process is something that is already in place under 35 Ill. Adm. Code 309. The Agency already had authority to inspect the wastewater conveyances, under Part 309, and now the Agency is teaming up with IEMA to do a dual inspection. Tr.1 at 30.

Mr. Cobb further testified that underground piping and other areas that have leaked in the past have been analyzed by the Fleetwood studies, so there are more detection devices in places where you might expect possible leaks. Tr.1 at 21-22. According to Mr. Cobb, underground piping, blowdown lines, and VB vaults are the primary areas for monitoring and all of these areas will be monitored under the integrated testing. Tr.1 at 22.

Mr. Cobb was asked whether concentrations of radionuclides in a blowdown which are greater than the concentration allowed by the NPDES permit but are permitted by the NRC are considered unpermitted releases. Tr.1 at 31. Mr. Cobb testified that the wastewater constituents in the wastewater/tritium mixture have their own NPDES limits while the tritium is diluted to meet the NRC limits. *Id.* The wastewater constituents are regulated by the state NPDES permit, but the tritium is regulated by the NRC only. Tr.1 at 32.

Mr. Cobb stated that the primary thing the Agency was looking at in protecting groundwater was the beneficial use of the groundwater resource. Tr.1 at 33-34. Mr. Cobb testified that a private well owner was the lowest common denominator in examining how to protect the groundwater for beneficial use by not causing, threatening, or allowing a release of a contaminant that is not removed by ordinary treatment techniques under the Board's Groundwater Quality Standards. Tr.1 at 34. Mr. Cobb went on to testify that he does not believe any radionuclide, other than tritium, will function as an indicator of release because the other radionuclides are removed via reverse osmosis and other technology. Tr.1 at 36. When asked what types of remedial actions are typically seen with these types of releases, Mr. Cobb explained that all remedial actions are different based upon the site hydrology and concentration. Tr.1 at 36-37.

Mr. Cobb also testified that the proposed sections 1010.202(c) and 1010.204(c), requiring the Agency to post the reports concerning a release that causes, threatens, or allows an

exceedance of the standards on its website were a good idea in parallel with the Right-to-Know provision of the Act (415 ILCS 5/25(d) (2006)). Tr.1 at 42. Mr. Cobb also stated that every site center generated notice or well centric generated notice is published on the Agency's Right-To-Know website. *Id.*

When questioned on whether posting of reports and other information on the Agency's website would compromise security at the Exelon facilities, Mr. Cobb stated that any security sensitive information would have been redacted before posting. Tr.1 at 43.

### **Kyle Rominger**

Mr. Rominger testified that while creating the reporting forms, the Agency found that they wished to make a change in Section 1010.204. Tr.2 at 7. The changes to the proposed rule would require a copy of the follow-up report be sent to IEMA and would therefore also insert IEMA address where the copy should be sent. *Id.* According to Mr. Rominger, the changes would also require the follow-up report to be submitted in both hard copy form and electronically. Tr.2 at 7-8. Mr. Rominger stated that the hard copy would get an additional five days to be submitted under this new proposal to avoid any issues with timeliness. Tr.2 at 8.

### **Exelon Testimony**

#### **Zigmund Karpa**

Mr. Karpa testified that NRC establishes the regulations and guides for the construction and operation of nuclear reactors. Exh. 3. at 3. Mr. Karpa further explained that utilities licensed by the NRC are responsible for designing, constructing, testing, and operating their facilities safely. *Id.* NRC regulations establish protection standards for nuclear facilities, including standards for the protection of members of the public. *Id.* Mr. Karpa went on to point out that 10 C.F.R. §20 requires that radioactive materials released from a facility must not cause the radioactive dose received by members of the public to exceed specified levels, as a result of the release. *Id.* These levels are meant to protect public health and wellbeing. Mr. Karpa stated that usually the release is a planned release and is done according to the established procedures of the facility. Exh. 3. at 4. Mr. Karpa further testified that plant inspectors first verify that the release will not exceed the dose limitations imposed by the NRC regulations. *Id.* Also, a pre-release permit is issued for these releases, and the releases are monitored to confirm that they actually conform to the prerelease plan. *Id.*

**Agency's Proposed Rules.** Mr. Karpa testified that Exelon will not object to Agency's proposed rules as currently written and offers no changes to the proposed rules. Exh. 3. at 4. Mr. Karpa further testified that since the proposed rules only apply to reporting of unpermitted releases of radionuclides under Section 13.6 of the Act, the vast majority of releases from Exelon facilities would not be governed by the rule. Exh. 3. at 4-5. The majority of releases from Exelon are controlled releases done under Exelon's NRC license. *Id.* Mr. Karpa went on to testify that Exelon anticipates that it will use the Section 1010.104 provision, which expressly provides that the rules do not prevent or preclude reporting of radionuclides that are not required

to be reported under section 13.6 of the Act (415 ILCS 5/13.6 (2006)), to voluntarily report releases that are not governed by these rules. *Id.*

Mr. Karpa testified that in the event of a release at an Exelon station that cannot be quantified for any reason, the release will be reported within the 24-hour notification process and will be clarified with a report under Section 13.6 of the Act (415 ILCS 5/13.6 (2006)). Tr.1 at 45. When asked about Exelon's security concerns regarding the reports, Mr. Karpa testified that there may be areas of the plants that are confidential and those reports would be submitted indicating that there is sensitive information either by NRC or US computer requirements. Tr.1 at 46. Mr. Karpa also stated that they have filed such reports in the past when submitting Exelon's hydrogeologic investigations for each site. *Id.*

Mr. Karpa, when addressing the economic reasonableness of the proposed rule, stated that nothing that Exelon is doing outside of their self-imposed groundwater or industry imposed groundwater monitoring programs, would result in additional costs for Exelon at this point. Tr.1 at 48. Mr. Karpa testified that frequent inspections are already being conducted at the Exelon facilities and the only other costs will be in providing information to IEMA and Agency when they conduct their quarterly inspections, so the costs would be reasonable. Tr.1 at 49.

Mr. Karpa commented that, with regard to Mr. Cobb's pre-filed testimony, Exelon does not believe that calculating background using a single sample is necessary. Tr.2 at 9. Mr. Karpa believes that the background calculation should be done using a much more scientific evaluation. *Id.*

## **DISCUSSION**

Section 13.6 of the Act (415 ILCS 5/13.6 (2006)) was enacted by P.A. 94-849 and amended by P.A. 95-066 (eff. Aug. 13, 2007). Section 13.6 regulates the release of radionuclides and requires detection and reporting of unpermitted releases. 415 ILCS 5/13.6(a) (2006). Unpermitted releases must be reported to the Agency and IEMA within 24 hours. 415 ILCS 5/13.6(b) (2006). Under Section 13.6, the Agency was required to propose rules to the Board prescribing standards for detecting and reporting of unpermitted releases. The Agency fulfilled the statutory obligation by proposing these rules to the Board. In addition, Section 13.6 of the Act (415 ILCS 5/13.6 (2006)) requires the Board to adopt the rules within one year of the Agency's proposal being filed. The Board proceeds to final notice today to ensure the timely adoption of the rules.

Section 27 of the Act (415 ILCS 5/27 (2006)) provides, in part that:

the Board shall take into account the existing physical conditions, the character of the area involved, including the character of the surrounding land uses, zoning classification, the nature of the existing air quality, or receiving body of water, as the case may be, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution. 415 ILCS 5/27(a) (2006).

Although only one corporation is impacted by these rules, the rules apply statewide and will apply to any successor corporation. Therefore, the rules are of general applicability and the Board must determine whether the rules are technically feasible and economically reasonable.

At first notice, the Board determined that the inspection and detection procedures show that the technical aspects of this proposed rule are already in place and that the detection devices and employee training are already being utilized in the Exelon facilities. Thus, the Board found that there would be no additional technological burden placed upon nuclear energy providers through this rule. The Board further found that the inspections already performed at the facilities assist in detecting unpermitted releases in a timely manner, which will be protective of the environment and human health.

The Board found at first notice that based on the record before the Board, the rules are economically reasonable and technically feasible. In addition, the Board found that the proposed rules are protective of the environment and human health. As stated previously, the Board received no additional public comment on this rulemaking during first notice. The Board therefore found that proceeding to second notice with the rule as proposed at first notice was warranted and the Board adopted the rule for second notice.

On April 15, 2008, JCAR voted to issue a certificate of no objection to the proposed rules. JCAR did not make any suggestions for changes to the rule. Therefore, the rule adopted by the Board is identical to the rule as proposed for second notice.

### **CONCLUSION**

Based on the record before the Board, the Board finds that the rules are economically reasonable and technically feasible. The Board also finds that the proposed rules will be protective of the environment and human health. Therefore, the Board finds that the record supports proceeding to final notice with these rules.

### **ORDER**

The Board directs the Clerk to cause the publication of the following rule for final notice in the *Illinois Register*.

TITLE 35: ENVIRONMENTAL PROTECTION  
SUBTITLE I: ATOMIC RADIATION  
CHAPTER I: POLLUTION CONTROL BOARD

PART 1010  
PROCEDURES FOR REPORTING RELEASES OF RADIONUCLIDES AT NUCLEAR  
POWER PLANTS

SUBPART A: GENERAL PROVISIONS

Section

1010.100	Purpose
1010.102	Applicability
1010.104	Scope
1010.106	Definitions
1010.108	Severability

## SUBPART B: REPORTING

1010.200	Evaluation of Releases
1010.202	Reporting of Releases
1010.204	Follow-up Written Report

**AUTHORITY:** Implementing and authorized by Section 13.6 and Section 27 of the Environmental Protection Act [415 ILCS 5/13.6, 27].

**SOURCE:** Adopted at 32 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_.

## SUBPART A: GENERAL PROVISIONS

### Section 1010.100 Purpose

This Part prescribes standards for detecting and reporting unpermitted releases of radionuclides from nuclear power plants pursuant to Section 13.6 of the Illinois Environmental Protection Act (Act) [415 ILCS 5/13.6].

### Section 1010.102 Applicability

This Part applies to licensees of nuclear power plants that are required under Section 13.6 of the Act to report an unpermitted release of a radionuclide.

### Section 1010.104 Scope

This Part sets forth the procedures licensees of nuclear power plants must follow to satisfy their obligation under Section 13.6 of the Act to report unpermitted releases of radionuclides to the Agency and to IEMA. This Part addresses only the reporting of unpermitted releases of radionuclides required under Section 13.6 of the Act. The requirements of this Part are independent of, and do not replace or supersede, any other reporting requirements in state or federal law or regulation. This Part does not prevent or preclude licensees from reporting releases of radionuclides that are not required to be reported under Section 13.6 of the Act.

### Section 1010.106 Definitions

Except as stated in this Section, or unless a different meaning of a word or term is clear from the context, the definition of words or terms in this Part shall be the same as that applied to the same words or terms in the Environmental Protection Act [415 ILCS 5].

“Act” means the Environmental Protection Act [415 ILCS 5].

“Agency” means the Illinois Environmental Protection Agency.

“Curie” or “Ci” means the quantity of radioactive material producing 37 billion nuclear transformations per second.

*"Groundwater" means underground water which occurs within the saturated zone and geologic materials where the fluid pressure in the pore space is equal to or greater than atmospheric pressure. [415 ILCS 5/3.64]*

“IEMA” means the Illinois Emergency Management Agency.

“L” means liter.

“Licensee” means the holder of a license issued for a nuclear power plant under Chapter I of Title 10 of the Code of Federal Regulations.

“Licensee controlled area” means the land or property that is owned, leased, or otherwise controlled by the licensee.

“Picocurie” or “pCi” means the quantity of radioactive material producing 2.22 nuclear transformations per minute. One pCi is one trillionth ( $10^{-12}$ ) of one curie.

*"Person" is any individual, partnership, co-partnership, firm, company, limited liability company, corporation, association, joint stock company, trust, estate, political subdivision, state agency, or any other legal entity, or their legal representative, agent, or assigns. [415 ILCS 5/3.315]*

“Station generated liquids” means liquids used in, or as a part of, the power generation process at a nuclear power plant and that contain, or potentially could contain, radionuclides.

“Surface water” means all water that is open to the atmosphere and subject to surface runoff.

*“Unpermitted release of a radionuclide” means any spilling, leaking, emitting, discharging, escaping, leaching, or disposing of a radionuclide into groundwater, surface water, or soil that is not permitted under State or federal law or regulation. [415 ILCS 5/13.6(c)]. “Unpermitted release of a radionuclide” does not include the discharge of a radionuclide from a point source at a designated process water or cooling water outfall identified in the nuclear power plant’s National Pollutant Discharge Elimination System permit, provided the discharge is authorized in the nuclear power plant’s United States Nuclear Regulatory Commission operating license.*

If any provision in this Part or its application to any person or under any circumstances is adjudged invalid, such adjudication shall not affect the validity of this Part as a whole or of any portion not adjudged invalid.

## SUBPART B: REPORTING

### Section 1010.200 Evaluation of Releases

Within 24 hours after an unpermitted release of a radionuclide from a nuclear power plant into groundwater, surface water, or soil, the licensee must evaluate the release in accordance with this Section to determine whether it must be reported. The evaluation cannot take into account remedial actions taken in response to the release (i.e., the evaluation must be based on the volumes of station generated liquids and concentrations or quantities of radionuclides released, not on the volumes of station generated liquids and concentrations or quantities of radionuclides remaining after the initiation or completion of response actions). If the release is required to be reported, the licensee must report the release in accordance with Section 1010.202 of this Part.

- a) Licensees must report unpermitted releases of station generated liquids that result in tritium concentrations of 200 pCi/L or more outside of the licensee controlled area.
- b) Licensees must report unpermitted releases of station generated liquids that contain tritium at quantities of 0.002 Curies or more.

### Section 1010.202 Reporting of Releases

- a) Reports required under Section 1010.200 of this Part must be given within 24 hours of the release to both the Agency and IEMA in accordance with the following:
  - 1) Reports to the Agency must be given by telephone and electronically. At the time these rules are adopted the Agency's telephone number for reporting environmental emergencies is 1-217-782-3637.
  - 2) Reports to IEMA must be given by telephone and electronically. At the time these rules are adopted IEMA's telephone number for reporting emergencies is 1-800-782-7860, or, if calling from outside Illinois, 1-217-782-7860.
  - 3) Electronic reports must be submitted on forms and in a format prescribed by the Agency, and must be submitted to addresses prescribed by the Agency and IEMA. The Agency shall consult with IEMA in developing the forms and format for electronic reports required under this Section.
- b) Reports required under Section 1010.200 of this Part must include, at a minimum, the following information using the best data available at the time of the report:

- 1) The name and address of the nuclear power plant where the release occurred;
  - 2) The name, signature, and telephone number of the Principal Executive Officer for the nuclear power plant or the Principal Executive Officer's authorized agent;
  - 3) The specific location of the release;
  - 4) The time and duration of the release;
  - 5) An estimate of the volume and radionuclide concentrations (in pCi/L) of station generated liquids released, and an estimate of the flow rate if the release is ongoing;
  - 6) Identification of the radionuclides released and an estimate of the quantities released (in Curies);
  - 7) Whether the release was to groundwater, surface water, or soil, and a description of the area into which the release occurred (e.g., field, ditch, stream, or other description) and the size of the area affected;
  - 8) The actions taken to respond to, contain, and mitigate the release;
  - 9) The known and anticipated impacts to human health and the environment, including but not limited to groundwater and surface water resources, as a result of the release;
  - 10) The names, addresses, and telephone numbers of persons at the nuclear power plant who may be contacted for further information regarding the release; and
  - 11) The name and mailing address of the licensee of the nuclear power plant.
- c) The Agency must post copies of the electronic reports it receives under this Section on the Agency's website.

#### Section 1010.204 Follow-up Written Report

An owner or operator who reports a release under this Part must provide to the Agency and to IEMA a follow-up written report of the release within five business days after reporting the release.

- a) The follow-up report must confirm and update the information provided by the licensee under Section 1010.202 of this Part utilizing the best data available, and must also include the following information:
- 1) Copies of all lab analyses used to confirm the presence of, or conducted in response to, the release if lab analyses have been conducted;
  - 2) Plan view and, if available, geological cross-section maps showing, at a minimum, the location of the release, the locations of samples taken to confirm the release if samples have been taken, the locations of samples taken in response to the release if samples have been taken, the measured and modeled extents of the release if known, the groundwater flow direction if known, groundwater contours if known, the boundary of the licensee controlled area, and structures, roads, and other surface features;
  - 3) An estimate of the volume and radionuclide concentrations (in pCi/L) of station generated liquids released but not recovered;
  - 4) An estimate of the quantities (in Curies) of radionuclides released but not recovered;
  - 5) An updated description of activities taken in response to the release;
  - 6) If additional activities in response to the release are planned, a description of such activities; and
  - 7) The name and signature of the Principal Executive Officer for the nuclear power plant or the Principal Executive Officer's authorized agent.
- b) The follow-up report must be submitted electronically on forms and in a format prescribed by the Agency, and must be submitted to addresses prescribed by the Agency and IEMA. Within five business days after submission of the electronic follow-up report, hard copies of the follow-up report must be submitted to the Agency and IEMA at the following addresses:

Illinois Environmental Protection Agency  
Bureau of Water  
Groundwater Section  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, Illinois 62794-9276

Illinois Emergency Management Agency  
Division of Nuclear Safety  
Bureau of Environmental Safety  
1035 Outer Park Drive

## Springfield, Il 62704

The Agency shall consult with IEMA in developing the forms and format for reports required under this Section.

- c) The Agency must post copies of the follow-up reports it receives under this Section on the Agency's website.

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2006); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, John T. Therriault, Assistant Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on May 1, 2008, by a vote of 4-0.



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John T. Therriault, Assistant Clerk  
Illinois Pollution Control Board