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Event Initial Report

Rapport initial d'événement

20/20 ND Technology Inc.

Potential dose limit exceedance for a certified
exposure device operator (CEDO)

20/20 ND Technology Inc.

Dépassement potentiel de la limite de dose
d'un opérateur d'appareil d'exposition
accrédité (OAEA)

Commission Meeting

Réunion de la Commission

March 15, 2018

Le 15 mars 2018

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EVENT INITIAL REPORT (EIR)

E-DOCS-# 5451947

EIR: Potential Dose Limit Exceedance for a Radiographer	
Prepared by: Nuclear Substances and Radiation Devices Licensing Division	
Licensee: 20/20 ND Technology Inc. CNSC Licence #: 14066-1-22.0	Location: Non-licensee location. Keyera (Wapiti) gas plant at 03-19-67-07-W6M (GPS 54.809913N, 119.057821W). 18.3 km S of Wapiti, Alberta (south of Grande Prairie)
Date Event was Discovered: 2018-01-30	Have Regulatory Reporting Requirements been met? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Proactive Disclosure: Licensee: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> CNSC: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Overview	
Reporting Criteria: Exposure of a person, organ or tissue to radiation in excess or potential for excess of the applicable radiation dose limits prescribed by the Radiation Protection Regulation.	
<p>Description: A licensee reported that, as a result of an unplanned event, an exposure device operator received an effective dose of greater than 150 mSv. The exposure device operator was removed from all work that could result in further potential exposures to radiation, pending the review of the information associated with the event.</p> <p>20/20 ND Technology Inc. is a CNSC licensee authorized to conduct operations involving industrial radiography. The licensee is based in Grande Prairie, Alberta and is authorized to conduct licensed activities throughout the provinces of Alberta, British Columbia, Saskatchewan and Manitoba. As of September 2017, the licensee reported employing 14 certified exposure device operators and two trainees.</p> <p>On Dec. 18, 2017, two employees of the licensee, a certified exposure device operator and a Level 2 technician, were conducting radiography operations at a third-party site; an industrial location south of Grande Prairie, Alberta. During these activities, the exposure device operator noted that the sealed source did not return as expected to the shielded position. The exposure device operator secured the site and contacted the licensee's Radiation Safety Officer (RSO) for source retrieval assistance, as required. The level 2 technician is not a certified exposure device operator and was not directly involved in the recovery operations.</p> <p>The licensee's RSO, a certified exposure device operator who had received the required source retrieval training, responded to the site and undertook emergency actions, including the placement of additional shielding over the position of the sealed source in the guide tube. The RSO was able to return the sealed source to the shielded position with direct manipulation of the sealed source using the appropriate handling tools.</p> <p>The direct reading dosimeter worn by the RSO indicated a whole body dose of 0.45 mSv as a result of the actions taken to manage the source disconnect. The RSO was also wearing a dosimeter from the dosimetry service provider, as required by sub-section 31(1) of the <i>Nuclear Substances and Radiation Devices Regulations</i>.</p> <p>On January 9, 2018, the licensee made the initial report to the CNSC, indicating that emergency response procedures, as referenced in the in the radiation safety manual were not followed by the RSO.</p> <p>On January 18, 2018, a CNSC Inspector and a CNSC Licensing Specialist conducted a visit at the licensee's site in Grande Prairie, Alberta. CNSC staff examined pertinent records, inspected the available radiography equipment that had been involved in the event and interviewed workers. During this site-visit, the RSO presented the CNSC staff with additional information regarding the event. At the time of the site visit, it was noted by CNSC staff that the dosimeters worn during the event on December 18 had not been sent for processing. The licensee made arrangements to send the dosimeters for this processing to the licensed dosimetry service provider.</p> <p>On January 30, 2018, the licensee reported to the CNSC that the radiation dose report for the RSO indicated a dose of 151.48 mSv. The dosimeters for the other two employees did not record significant radiation exposures. The dose report was from CNSC- licensed dosimetry service provider used by the licensee (Health Canada National Dosimetry Services, NDS). The employee is designated as a Nuclear Energy Worker (NEW) and the reported dose exceeds the annual regulatory limit of 50 mSv for a NEW and the 5 year regulatory limit of 100 mSv for a NEW, as stipulated in s. 13 of the <i>Radiation Protection Regulations</i>.</p> <p>The employee has worked as an exposure device operator or qualified operator since 1982 and has been employed by the licensee since 2007, at which time he was appointed the RSO for the licensee. The RSO took specialized source retrieval training in 2007, as required by paragraph 31(6) of the <i>Nuclear Substances and Radiation Devices Regulations</i>.</p> <p>In response to the reported overexposure, the licensee took the actions required by section 16 of the <i>Radiation Protection</i></p>	

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Regulations; removing the employee from work that could have added to the dose received, notifying the CNSC of the dosimetry result, and performed an investigation to determine the cause of the exposure.

The licensee's investigation of the event proposes that the dose received by the RSO's dosimeter is non-personal since it does not coincide with the value recorded by the direct reading dosimeter also worn by this person. Furthermore, the RSO believes that the dosimeter fell from his clothing during the retrieval event, where it could have received the claimed non-representative exposure.

Cause(s): An event occurred during radiography source recovery operations which required emergency actions to be taken by the RSO. The RSO failed to follow appropriate emergency response procedures and there was potential for an overexposure.

Impact of the Event

On People:

How many workers have been (or may be) affected? 1

How many members of the public have been (or may be) affected by the event? 0

How were they affected?

The individual involved received a dose in excess of the annual and 5 year regulatory effective dose limit for NEWs.

On the Environment: None

Other Implications: None

Licensee Actions

Taken or in Progress: The worker has been removed from any activities that could contribute to any further dose but remains employed by the licensee. Dose calculations to estimate the dose to the RSO from the source retrieval activities were performed by the licensee and submitted to the CNSC for evaluation.

The following were the commitments made by the Applicant Authority during the on-site visit by CNSC staff on January 18, 2018:

1. Immediately appoint another person as Radiation Safety Officer. *Completed January 18, 2018.*
2. Immediately submit dosimeters worn during the event of December 18, 2017 for emergency reading at Health Canada and submit the results to the Canadian Nuclear Safety Commission as soon as they become available. *Completed.*
3. Ensure that the new RSO and an additional person receive Radiation Safety Officer training satisfactorily to the Canadian Nuclear Safety Commission, by January 31, 2018. *Completed January 28, 2018.*
4. Ensure that there will always be available a suitably trained person to deal with emergency situations as described in Nuclear Substance and Radiation Devices Regulations 30(7). *Completed.*
5. Complete an incident report to include a root cause analysis, a report on the evaluation of the degree of exposure device component failure, an estimate of extremity exposures and actions to prevent recurrence. This report to be submitted to the licensing specialist by January 31, 2018. *Completed, with additional information supplied on February 15, 2018.*
6. Put together a comprehensive source recovery emergency kit to be completed by January 31, 2018. *Completed.*
7. Immediately take exposure device serial 03358 out of service and return it to the manufacturer or manufacturer's representative for evaluation for possible compromise of the Posilock mechanism. *Completed January 18, 2018.*
8. Take QSA source model A424-9 serial number 59579G out of service and arrange to have it returned to the manufacturer for evaluation of the capability of the source connector assembly to pass the manufacturers pull test. This is because it has likely been compromised during of the event of December 18, 2017. *Completed January 18, 2018.*
9. Notify the manufacturer of a component failure (male connector and drive cable) describing the part numbers and the likely mechanism of such failure. *Completed.*

A full report describing the completion of the above items was submitted to CNSC staff by February 16, 2018.

Planned: The licensee is in communication with the CNSC's Radiation Protection Division with respect to the worker dose.

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CNSC Actions

Taken or in Progress: Following the notification of the CNSC by the licensee on January 9, 2018, CNSC staff conducted an on-site visit with the licensee to obtain further information regarding the nature of the event and the actions that were taken by licensee staff.

CNSC staff received the initial report on January 10, 2018 and initiated an evaluation of the available information.

On January 18, 2018, a CNSC Inspector and a CNSC Licensing Specialist visited the licensee's premises in Grande Prairie, Alberta, reviewed documents and interviewed licensee staff who were involved in the event.

CNSC staff received the required written report from the licensee on February 1, 2018 and further information from the licensee on February 15, 2018. CNSC staff continue to evaluate the information provided by the licensee, including the potential that the dose attributed to this person could be considered non-personal.

CNSC staff are in communication with the licensee to confirm that all proposed and committed actions satisfactorily address all deficiencies noted in the event investigation.

The CNSC Radiation Protection Division (RPD) is reviewing the information submitted by the licensee to determine if the dose received by the person could be considered as non-personal. RPD has arranged for biodosimetry, through blood sample analysis, to confirm whether or not the person received the dose reported by the dosimeter. Arrangements for the blood test were made through the existing CNSC agreement with Health Canada. The blood work was arranged for March 5, 2018, at no cost to the licensee or the person involved.

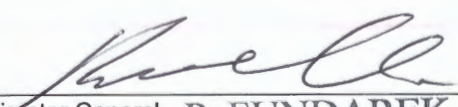
Planned: Review of the licensee's response, including any information to support designating the dose as non-personal. Further regulatory action may be required. CNSC staff will follow-up on the biodosimetry result for the affected individual, through the Radiation Protection Division and Health Canada. Analysis of the blood sample should take approximately one month to complete.

Additional reporting to the Commission Members anticipated:

Yes

No

If Yes, provide method of reporting: Updated EIR.

Name and Title	Signature
<p>Colin Moses</p> <p>Directorate of Nuclear Substance Regulation</p>	 <hr style="width: 100%;"/> <p>Director General P. FUNDAREK</p>
	<p>MAR 09 2018</p> <hr style="width: 100%;"/> <p>Date</p>