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RULES AND DIRECTIVES
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Cindy Bladey
Office of Administration
Mail Stop: OWFN–12–H08,
U.S. Nuclear Regulatory Commission
Washington, DC 20555–0001

Dear Ms. Bladey,

The Source Accountability and Security Working Group is pleased to submit the enclosed comments for the NRC's consideration (Docket NRC-2016-0276).

Warmest Regards,

Roland Backhaus JRH

Roland Backhaus

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Comments Submitted by the Source Accountability and Security Working Group in Response to the NRC's Questions to Stakeholders Regarding the Desirability of Amending the NRC's Rules Pertaining to the Security and Accountability of Certain Radioactive Material (Docket ID NRC-2016-0276)

March 10, 2017

These comments were prepared by Pillsbury Winthrop Shaw Pittman LLP on behalf of the Source Security and Accountability Working Group ("SSAWG" or "Group"). The comments respond to questions published by the U.S. Nuclear Regulatory Commission's ("NRC's") issuance of questions published in the Federal Register on January 9, 2017 regarding the potential revision of certain of the NRC's rules in Title 10 of the Code of Federal Regulations regarding the security and accountability of Category 3 quantities of radioactive material ("RAM"). The SSAWG is comprised of a number of radioactive material licensees, including CITGO Petroleum Corporation, TechnipFMC, and Emerson Electric Company all of which participate in the oil & gas and petrochemical industries.

The Group's comments reflect each member's significant experience and activities related to the possession and transfer of RAM. Further, these comments seek to articulate the Group's observations regarding the possession and transfer of radioactive material by other licensees that participate in the oil & gas and petrochemical industries.

INTRODUCTION

On October 18, 2016, the Commission issued a Staff Requirements Memorandum ("SRM")[1] which directed NRC staff to take specific actions to evaluate whether it is necessary to revise NRC regulations or processes governing source protection and accountability. Specifically, the Commission asked the staff to evaluate, among other things, the pros and cons of different methods of requiring transferors of Category 3 quantities of radioactive material to verify the transferee's license, the pros and cons of tracking Category 3 sources in the National Source Tracking System ("NSTS"), and the risks posed by the aggregation of Category 3 sources into Category 2 quantities. As part of this evaluation, the NRC sought input from licensees, Agreement States, and the public to inform the staff's assessment of potential revisions to regulations or processes requiring Category 3 source protection and accountability. On January 9, 2017, the NRC published a Federal Register Notice which posed several questions to those stakeholders ("NRC's Questions"). The NRC developed the questions to elicit responses which would allow the NRC to more fully conduct the evaluation directed by the Commission. The NRC separated the questions into groups, and directed certain groups to Agreement State regulators, certain groups to licensees, and one group to both Agreement State regulators and to licensees.

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[1] Staff Requirements – COMJMB-16-0001 – Proposed Staff Re-evaluation of Category 3 Source Accountability (Oct. 16, 2016), *available at* https://www.nrc.gov/docs/ML1629/ML16292A812.pdf.

These Comments provide general comments and observations regarding the desirability of revising the NRC's regulations or processes governing source protection and accountability. Further, these Comments respond to each of the NRC's Questions directed to licensees.

After significant consideration, the Group believes that the NRC should not revise its regulations regarding the security and accountability of Category 3 quantities of byproduct material.[2] The discussion below provides the bases for this conclusion.

GENERAL COMMENTS AND OBSERVATIONS

As a threshold matter, the Group offers the following general observations for the NRC's consideration.

1. General Comment / Observation 1

The SSAWG notes that, as described below in more detail, the NRC's approach to regulating the possession and transfer of varying quantities of radioactive material is based on extensive and recurring evaluations performed by both the International Atomic Energy Agency ("IAEA") and the NRC over the course of several decades.

More specifically, the IAEA has conducted a thorough evaluation of the radioisotopes – and the quantities of those isotopes - that could pose a threat to safety and security. The IAEA's Code of Conduct on the Safety and Security of Radioactive Sources ("Code of Conduct")[3] documents that evaluation and the conclusions therefrom. The Code of Conduct established a tiered approach to the management and regulation of certain radioactive isotopes by establishing five 'categories' which account for the risk significance of certain quantities of those radioisotopes.

Separately, the U.S. Department of Energy ("DOE") and the NRC reviewed the chemical, physical, and radiological characteristics of each isotope that is licensed in the United States for its attractiveness to a terrorist. This effort identified 16 isotopes that could pose a serious threat to people and the environment if used malevolently. This effort further identified the quantities (or "thresholds") of materials that could pose a terrorism risk. The DOE and NRC's findings regarding risk significance of specific quantities of each isotope closely correspond to the IAEA's findings. The NRC adopted the IAEA's Category 1 and Category 2 threshold quantities to provide consistency between domestic and international efforts for security of radioactive materials that are deemed to be attractive targets for malevolent use.

In order to provide for a periodic review of the regulations in light of new developments, Congress established an inter-agency Task Force on Radiation Source Protection and Security ("Task Force) in 2005. In 2006, and every four years thereafter, the Task Force has evaluated

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[2] As noted below, the Group offers no comment as to the desirability of revising the NRC's regulations regarding the security and accountability of either source material or special nuclear material.

[3] Code of Conduct on the Safety and Security of Radioactive Sources (2004), *available at* http://www-pub.iaea.org/MTCD/publications/PDF/Code-2004_web.pdf.

developments regarding the security and accountability of radioactive material and the extent to which those developments counsel for revisions to the NRC's regulations regarding source security and accountability. None of the three Task Force reports that have been issued to date suggest that the NRC should revise its regulations related to the use and transfer of Category 3 quantities of radioactive material in the way that (it appears) the NRC is currently considering.[4]

The risk to public health and safety aggregating RAM was well known to the IAEA, the NRC, and the Task Force throughout all relevant periods.

Despite this risk, however, the NRC has developed and maintained a regulatory structure which rightly recognizes the different risks to public health and safety arising from each category of RAM. Specifically, NRC regulations regarding the physical security of the source, the transfer of the source (and the reporting of the transfer of the source), and the manner in which the source is tracked, become more stringent as the quantity of a particular isotope becomes more risk significant. This regulatory structure accounts for increased risk to public health and safety arising from aggregation of RAM.

The SSAWG is aware that recent investigations by the Government Accountability Office ("GAO") have caused the NRC to reevaluate regulations regarding the security and accountability of Category 3 quantities of RAM. The Group notes that the NRC has evaluated the risks posed by the aggregation of RAM in the past, and that the NRC has, as a result of those evaluations, established and maintained a regulatory system which promotes a balanced approach to managing those risks. The SSAWG is unaware of any fact that changes the validity of the NRC's previous evaluations or the NRC's conclusions based thereon. The Group believes that the NRC and the Agreement State regulators were aware of the risks identified by GAO and had evaluated those risks.

Thus, because the NRC's current regulations reflect the evaluations by the IAEA, the NRC, and the Task Force, and because the bases of those evaluations and their conclusions are still valid, the Group believes that the NRC should not revise its regulations regarding the security and accountability of Category 3 quantities of byproduct material.

2. General Comment / Observation 2

The SSAWG understands that the GAO's 2014-2015 investigation precipitated the NRC's current evaluation as to whether it is necessary or desirable to revise NRC regulations or processes governing source security and accountability. The SSAWG also understands that the investigation identified certain weaknesses in the application of one Agreement State's pre-licensing guidance which allowed that state's regulator to issue a RAM license to the GAO

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[4] *See* Radiation Source Protection and Security Task Force Report (August 2006) *available at* https://nrc.gov/reading-rm/doc-collections/congress-docs/correspondence/2006/president-08-15-2006.pdf; Radiation Source Protection and Security Task Force Report (August 2010) *available at* Radiation Source Protection and Security Task Force Report, August 2010) *available at* https://nrc.gov/security/byproduct/2010-task-force-report.pdf; and Radiation Source Protection and Security Task Force Report (August 2014) *available at* https://nrc.gov/security/byproduct/2014-task-force-report.pdf.

investigator. The SSAWG further understands that the GAO investigator placed an order for a Category 3 source, altered the license, and placed a second order for another Category 3 source, thereby allowing the GAO investigator to acquire an aggregated Category 2 quantity of RAM.

Thus, the GAO identified two types of weaknesses.

First, the GAO identified certain weaknesses in the application of one Agreement State's pre-licensing activities. The SSAWG offers the following observations.

- First, the extent to which the findings of the GAO's investigation suggest a programmatic weakness in the pre-licensing activities of any regulator – Agreement State or NRC – is unclear. Rather, the GAO investigation merely identified one instance of one reviewer in one Agreement State's regulator not adhering to non-mandatory guidance regarding the performance of pre-licensing activities. The Group believes that, while the GAO investigation's findings serve as a data point which should be considered, the NRC should not understand, without more, that a programmatic weakness in regulators' pre-licensing activities exists.

- Second, it is important to note that regulators conduct pre-licensing activities in accordance with non-mandatory guidance, and not in accordance with a mandatory process. Accordingly, and assuming that the application of the non-mandatory guidance would prevent the regulator from issuing a RAM license to an entity which should not possess that license, the NRC and Agreement States could consider making that guidance mandatory.

- Finally, the GAO's identification of weaknesses in a regulator's application of pre-licensing guidance, no matter how prevalent, is unrelated to any activity that a licensee undertakes pursuant to its RAM license. Nonetheless, the vast majority of the NRC's Questions contemplate revisions to the NRC's regulations that, if approved, would place a burden not on the regulator, but rather on the licensee. The Group notes that it is unclear how any of the proposed revisions to the NRC's regulations contemplated by the NRC's Questions would remedy any weakness within the regulator to appropriately perform pre-licensing activities.

Second, the GAO identified the fact that a nefarious Category 3 licensee could alter his paper radioactive material license, and that, because transferors of Category 3 quantities of RAM are not required to verify the transferee's license via the License Verification System ("LVS"), and because transfers of Category 3 quantities of RAM are not required to be tracked with the NSTS, such a licensee could obtain RAM in quantities greater than that which is allowed by the license. In light of these findings, the GAO recommended that the NRC require that licensees track Category 3 sources in the NSTS, and that transferors of Category 3 sources verify the transferees' licenses before transferring the RAM, among other recommendations. Although these recommendations seem reasonable, there are practical difficulties with their application, as described in more detail below.

Thus, the Group believes that the revisions to the NRC's regulations that the NRC is currently contemplating are either unrelated to the weaknesses identified by the GAO, and are therefore unlikely to remedy those weaknesses, or would be practically difficult to implement.

3. General Comment / Observation 3

It appears that the revisions to the regulations that the NRC is considering presuppose the presence of a nefarious licensee. More specifically, it appears that those revisions are solely intended to prevent a nefarious licensee from possessing via aggregation quantities of RAM in excess of the quantities which he is otherwise licensed to possess. The Group offers the following observations.

- First, the SSAWG is unaware of any case – other than the cases documented in the GAO Report[5] -- in which a nefarious licensee has attempted to aggregate risk significant quantities of RAM by altering a RAM license and placing orders for RAM with vendors. If such an occurrence is uncommon or nonexistent, the NRC should reconsider the revising its regulations in response to the potential, but as of yet speculative, risk.

- Second, if the NRC understands that there is an unacceptable risk that a nefarious licensee could take an action that is inconsistent with preserving public health and safety, the NRC should consider what additional measures regulators can and should take to prevent a nefarious person from becoming a licensee or occupying a role within a licensee to order, accept, or otherwise handle RAM. Such an approach would mitigate the potential risk to public health and safety while not additionally burdening licensees whose activities are not nefarious and who operate in accordance with the NRC's and Agreement States' regulatory frameworks.

Thus, the Group believes that, if the NRC is concerned with the potential activities of a nefarious licensee (or a nefarious person within a licensee who has access to RAM), the NRC should consider additional measures that the regulator can and should take to prevent that person from becoming a licensee or otherwise having access to RAM.

4. General Comment / Observation 4

It appears that the NRC is considering revising its regulations to require that transferors of Category 3 quantities of RAM use the LVS to verify the proposed transferee's license[6] and that

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[5] GAO-16-330, "Nuclear Security: NRC Has Enhanced the Controls of Dangerous Radioactive Materials, but Vulnerabilities Remain" (July 2016).

[6] *See, e.g.*, General Questions Related to License Verification, Question 1, *asking* "Should the current methods for verification of licenses prior to transferring Category 3 quantities of radioactive material listed in 10 CFR30.41(d)(1)–(5), 10 CFR 40.51(d)(1)–(5), and 10 CFR 70.42(d)(1)–(5) be changed such that only the methods prescribed in 10 CFR 37.71 are allowed?"

transferors track the transfers of Category 3 sources via the NSTS.[7] The Group offers the following observations.

- First, to the extent that the NRC is considering such revisions to make it more difficult for a nefarious licensee to aggregate risk significant quantities of RAM, the Group observes that the NRC must similarly revise its regulations to also require transferors to track Category 3 sources via the NSTS, as the use of just one of the systems will not create a meaningful impediment to that nefarious licensee.

- Second, the Group observes that, should the NRC revise its regulations to require that transferors use the LVS to verify a proposed transferee's license, that the NRC must be able to ensure that both the LVS and the NSTS are maintained perfectly current in order to both permit authorized transfers of RAM and to prevent unauthorized transfers of RAM.

- Third, the Group observes that, in order to be most effective at preventing the transfer of RAM to a nefarious licensee, the NRC should require that the transferor reflect the transfer of RAM in the NSTS prior to shipping the RAM to the transferee.

- Finally, the Group observes that, even where the NRC requires the use of the LVS and the NSTS as described just above, a nefarious licensee could nonetheless aggregate risk significant quantities of RAM by placing orders for Category 4 quantities of RAM or by other means.

As noted above, the Group believes that the NRC should not revise its regulations regarding the security and accountability of Category 3 quantities of byproduct material. Nonetheless, should the NRC revise its regulations to require that licensees use the LVS and the NSTS, it should understand that such revisions can only provide a meaningful impediment to a nefarious licensee seeking to obtain risk significant quantities of RAM via aggregation where the NRC requires the use of both the LVS and the NSTS and where both systems are maintained perfectly current.

5. General Comment / Observation 4

It appears that the NRC is considering revising its regulations related to the security and accountability of Category 3 quantities of RAM so as to make them more stringent regarding license verification, tracking, and physical security. It appears that the NRC is considering doing so only for the isotopes listed in 10 C.F.R. Part 37 Appendix E and 10 C.F.R Part 20 Appendix A. The Group observes that several entities in the oil & gas and petrochemical industries use either or both Cs-137 and / or Ba-133, among other isotopes. Whereas Cs-137 is listed in both appendices, and would, therefore be regulated in the more stringent fashion, Ba-133 is not listed in either appendix, and would, therefore not be regulated in a more stringent fashion. To the extent that an entity uses Cs-137 and not Ba-133, that entity would be significantly

[7] *See, e.g.*, General Questions Related to the NSTS, Question 1, *asking*, "Should Category 3 sources be included in the NSTS? Please provide a rationale for your answer."

disadvantaged by the more stringent regulations as compared to an entity which uses Ba-133 and not Cs-137. Should the NRC revise its regulations related to the security and accountability of Category 3 quantities of the isotopes listed in 10 C.F.R. Part 37 Appendix E and 10 C.F.R Part 20 Appendix A so as to make them more stringent, entities that use those isotopes would likely experience a significant and disproportionate commercial burden.

SPECIFIC RESPONSES TO NRC QUESTIONS TO LICENSEES

As noted above, the January 9, 2017 Federal Register Notice posed several questions to stakeholders. The NRC separated the questions into groups, and directed certain groups to Agreement State regulators, certain groups to licensees, and one group to both Agreement State regulators and to licensees. These groups include "General Questions Related to License Verification," "General Questions Related to the NSTS," "Specific Questions for Licensees Related to License Verification," "Specific Questions for Licensees Related to the NSTS," and "Other Questions."

The Group offers the following responses to the NRC's Questions which are most directly applicable to licensees.

1. General Questions Related to License Verification

Question 1: Should the current methods for verification of licenses prior to transferring Category 3 quantities of radioactive material listed in 10 CFR30.41(d)(1)–(5), 10 CFR 40.51(d)(1)–(5), and 10 CFR 70.42(d)(1)–(5) be changed such that only the methods prescribed in 10 CFR 37.71 are allowed?

Response: The Group believes that the NRC should not revise its regulations as described. The bases for the Group's belief are provided below.

10 C.F.R. 30.41(d)(1)–(5), 10 C.F.R. 40.51(d)(1)–(5), and 10 C.F.R. 70.42(d)(1)–(5), respectively, provide the means by which a transferor of byproduct material, source material, and special nuclear material may verify that the proposed transferee's license authorizes it to possess those materials. More specifically, these sections allow a transferor of those radioactive materials to review a copy of the transferee's license provided to him by the transferee. 10 C.F.R. 37.71 provides the means by which a transferor of Category 1 and 2 quantities of RAM may verify that the proposed transferee's license authorizes it to possess those quantities of RAM. More specifically, this section provides that a transferor of those quantities of RAM must verify the proposed transferee's license via either the LVS or alternate means, which includes the use of the NRC Form 749.

The Group offers no comment as to the desirability of requiring that transferors of source material or special nuclear material verify the proposed transferee's license in accordance with 10 C.F.R. 37.71.

The Group, however, offers the following observations regarding the desirability of requiring that transferors of byproduct material verify the proposed transferee's license in accordance with 10 C.F.R. 37.71.

- First, it seems necessary that, for a transferor to verify a proposed transferee's license, the proposed transferee must in fact possess a physical license. The SSAWG observes that many entities that possess Category 3 sources do so pursuant to the general license provided at 10 C.F.R. 31.5 and the corresponding Agreement State regulations. Where a general license authorizes the use and possession of RAM, the licensee does not possess a physical license, but rather relies on the license provided in the regulation. Should the NRC require that transferors of Category 3 quantities of byproduct material verify the proposed transferee's license in accordance with 10 C.F.R. 37.71, proposed transferees would, presumably, need to become specific licensees so as to possess a physical, verifiable, license. The NRC and Agreement State regulators should consider the burden to the regulator associated with the issuance of specific licenses to each entity which had previously possessed Category 3 sources pursuant to a general license. In addition, specific licensees bear additional cost and regulatory burdens not born by entities which use and possess RAM pursuant to a general license. The NRC should consider the effect of the additional cost and regulatory burden on these entities should the NRC require them to become specific licensees. The cost of applying for a RAM license varies among the regulators and depending upon the proposed use of the material. The Group notes that entities that apply for specific licenses often hire radiation safety licensing professionals to assist in the development of the license application and the related documents and programs and that the costs for these services are in addition to the fees charged by the regulator. Table 1, below, provides a representative sample of the costs which could accrue to a Category 3 general licensee should the NRC require it to become a specific licensee.

Table 1: Representative Sample of Costs

Requirement	**Cost**	
	Initial	**Annual**
License Fee (NRC Gauge)	$ 3,100.00	
Consultant Fee or In-house Expense to Prepare Application	$ 10,000.00	
Radiation Survey Equipment (Acquisition and Annual Calibration, Maintenance and Replacement)	$ 5,000.00	$ 500.00
Staff Training and Retraining Cost	$ 10,000.00	$ 2,000.00
RSO Salary and Fringe	$ 105,000.00	$ 105,000.00

Requirement	Cost	
	Initial	Annual
Annual Program Cost (General Administrative and Overhead)	$ 40,000.00	$ 40,000.00
Total	$ 173,100.00	$ 147,500.00

- Second, and relatedly, the SSAWG observes that many entities possess certain RAM pursuant to a specific license and other RAM pursuant to a general license. Should the NRC require that transferors of Category 3 quantities of byproduct material verify the proposed transferee's license in accordance with 10 C.F.R. 37.71, proposed transferees would, presumably, be required to amend their specific licenses such that those amended specific licenses would additionally authorize the use possession of the Category 3 quantities of RAM (which the specific licensee would have previously been able to possess pursuant to a general license). As noted just above, the NRC and Agreement State regulators should consider the burden to the regulator associated with the need to review the significant number of license amendment applications requesting revisions to support the possession of Category 3 quantities of RAM which they would have previously been able to possess pursuant to a general license. Also as noted just above, specific licensees bear additional cost and regulatory burdens not born by entities which possess RAM pursuant to a general license. The cost of applying for a license amendment varies among the regulators and depending upon the proposed use of the material. The Group notes that entities that apply for amendments to specific licenses often hire radiation safety licensing professionals to assist in the development of the license amendment application and the related documents and programs and that the costs for these services are in addition to the fees charged by the regulator. The NRC should consider the effect of the additional cost and regulatory burden on these entities should they be required to become specifically licensed to use and possess Category 3 quantities of RAM.

- Third, the Group further notes that many regulators charge periodic fees to maintain a specific license and that their reliance on the general license granted in 10 C.F.R. 31.5 and in the corresponding state regulations has allowed licensees to avoid the significant costs described above while providing for sufficient security and accountability of at-issue Category 3 sources.

- Fourth, because it seems that all entities which use and possess Category 3 quantities of RAM would need to become specific licensees so as to allow a transferor of Category 3 quantities of RAM to be able to verify the their licenses in accordance with 10 C.F.R.

37.71, it is not clear how the general license provided at 10 C.F.R. 31.5 could continue to exist.

- Finally, and as noted above, the NRC has historically regulated the use and transfer of RAM based in part on the category of radioactive material to be used or transferred. In so doing, the NRC applies a graded approach to regulation. For example, the NRC's current regulations allow a transferor of Category 3 quantities of RAM to verify the proposed transferee's license by reviewing a copy of the license provided by the proposed transferee. Should the NRC revise its regulations to require that that transferor verify the proposed transferee's license in accordance with 10 C.F.R. 37.71, the NRC would be blurring one of the distinguishing features of the historical graded approach to the regulation of RAM.

Question 2: Would there be an increase in safety and/or security if the regulations were changed to only allow license verification through the NRC's License Verification System (LVS) or the transferee's license issuing authority for transfers of Category 3 quantities of radioactive material? If so, how much of an increase would there be?

Response: The Group believes that revisions to the NRC's regulations to only allow license verification as described above would result in only a negligible increase in safety and security of Category 3 sources. Nonetheless, the Group believes that, if the NRC were to revise its regulations to require the real-time tracking of Category 3 sources in the NSTS in conjunction with the revisions described above, a modest increase in safety and security could result. The bases for the Group's belief are provided below.

As noted above, to the extent that the NRC is considering such revisions to make it more difficult for a nefarious licensee to aggregate risk significant quantities of RAM, the Group observes that the NRC must require the use of both the LVS and the NSTS, as the use of just one of the systems will not create a meaningful impediment to that nefarious licensee. For example, should the NRC revise its regulations to require only that transferors verify the proposed transferee's license via the LVS (and do not revise the regulations to also require the tracking of Category 3 sources in the NSTS), a nefarious licensee would be able to rely on his unaltered license in the LVS to acquire risk significant quantities of RAM via aggregation of Category 3 quantities of RAM. The Group further observes that even if the NRC requires the use of the LVS and the NSTS as described above, a nefarious licensee would still be able to acquire risk significant quantities of RAM via aggregation of Category 4 (or Category 5) quantities of RAM.

Question 3: If the NRC changed the regulations to limit license verification only through the LVS or the transferee's license issuing authority for transfers of Category 3 quantities of radioactive material, should licensees transferring Category 3 quantities to manufacturers and distributors be excepted from the limitation?

Response: The Group believes that should the NRC revise its regulations as described above, that the NRC should consider a more relaxed license verification standard for all transfers of Category 3 quantities of byproduct material where the transferor is familiar with the transferee,

including, but not limited to transfers to manufacturers and distributors. The bases for the Group's belief are provided below.

The Group understands that the NRC is considering revising its regulations to require that transferors of Category 3 quantities of RAM verify the proposed transferee's license in accordance with 10 C.F.R. 37.71. The Group also understands that the NRC is considering exempting transfers of Category 3 quantities of RAM to manufacturers and distributors, and, instead, continuing to allow those transferors to verify the manufacturer's and distributor's license as provided in 10 C.F.R. 30.41 (in the case of the transfer of Category 3 quantities of byproduct material).

- First, the Group notes that it favors the continuation of the current graded regulatory approach regarding the verification of proposed transferees' licenses based on the Categories of RAM to be transferred. Nonetheless, the Group understands that the NRC might revise its regulations to require that transferors of Category 3 quantities of RAM verify proposed transferees' licenses in accordance with 10 C.F.R. 37.71. Should the NRC do so, the Group supports the use of a less burdensome standard, such as the method provided in 10 C.F.R. 30.41, for the transfers of Category 3 quantities of RAM to all licensees with which the transferor is familiar, including, but not limited to, manufacturers and distributors.

- Second, the Group notes that many licensees are considered manufacturers/distributors of one type of radioactive material or device, but are not considered manufacturers/distributors of other types of radioactive material or devices. Thus, it is unclear whether the NRC is considering a less burdensome standard for transfers of RAM and devices to manufacturers/distributors regardless of whether the manufacturer/distributor originally manufactured or distributed the material or device to be transferred, or only for transfers of RAM and devices to the manufacturers/distributors which originally manufactured/distributed the specific material or device to be transferred.

2. General Questions Related to the NSTS

Question 1: Should Category 3 sources be included in the NSTS? Please provide a rationale for your answer.

Response: The Group believes that revisions to the NRC's regulations to require licensees to track Category 3 sources in the NSTS would result in only a negligible increase in safety and security of Category 3 sources. Nonetheless, the Group believes that, if the NRC were to revise its regulations to require transferors of Category 3 quantities of RAM to verify the licenses of proposed transferees in accordance with 10 C.F.R. 37.71, a modest increase in safety and security could result. The bases for the Group's belief are provided below.

- First, and as noted above in the context of the whether the NRC should require the use of the LVS to verify the proposed transferee's license, to the extent that the NRC is

considering such revisions to make it more difficult for a nefarious licensee to aggregate risk significant quantities of RAM, the Group observes that the NRC must require the use of both the LVS and the NSTS, as the use of just one of the systems will not create a meaningful impediment to that nefarious licensee. For example, should the NRC revise its regulations to require only that transferors reflect the transfer of Category 3 sources in the NSTS (and do not revise the regulations to also require the use of the LVS to verify the proposed transferee's license), a nefarious licensee would be able aggregate risk significant quantities of RAM in the same ways that he would be able to aggregate them absent the revision to the regulations. The Group further observes that even if the NRC requires the use of the LVS and the NSTS as described above, a nefarious licensee would still be able to acquire risk significant quantities of RAM via aggregation of Category 4 (or Category 5) quantities of RAM.

- Second, the Group observes that should the NRC require the use of both the LVS and the NSTS as articulated in the January 9, 2017 Federal Register Notice, both the LVS and the NSTS must be maintained perfectly current in order to both permit authorized transfers of RAM and to prevent unauthorized transfers of RAM.

- Third, the Group suggests that the NRC consider the ability of the NSTS to effectively track the many more sources that would be tracked in the system should the NRC require licensees to use it to track Category 3 sources.

- Fourth, the Group recognizes the risk to public health and safety that could arise should the security of the NSTS become compromised by cyberattack or by other means. Should the NRC require the use of the NSTS to additionally track Category 3 sources, the security of the NSTS against cyber and other threats would become even more important.

Question 2: If Category 3 sources are included in the NSTS, should the NRC consider imposing the same reporting requirements currently required for Category 1 and 2 sources (10 CFR 20.2207(f))?

Response: The Group believes that, should the NRC require the tracking of Category 3 sources in the NSTS, it should require that licensees maintain the NSTS perfectly current, and should not permit even the delay provided in 10 C.F.R. 20.2207(f).

- First, and for the reasons provided above, the Group does not believe that the NRC should revise its regulations to require the tracking of Category 3 sources in the NSTS.

- Second, the Group notes that the use of the LVS and the NSTS to lessen the risks associated with the aggregation of RAM by a nefarious licensee is only meaningful when both the LVS and the NSTS are maintained perfectly current. The failure to maintain both systems perfectly current could, on one hand, prevent the transfer of RAM that would be authorized absent a delay, and on the other hand, allow a transfer of RAM to a nefarious licensee that would be prevented absent the delay.

- Finally, the Group notes that even the delay in reporting that is permitted by 10 C.F.R. 20.2207(f) could precipitate the problems described just above.

Question 3: Would there be an increase in safety and/or security if the regulations were changed to include Category 3 sources in the NSTS? If so, how much of an increase would there be?

Response: For the reasons provided above, the Group believes that the use of the NSTS to track Category 3 quantities of RAM could only promote safety and security if it was used in conjunction with the LVS and if both the LVS and the NSTS are maintained perfectly current. The Group further believes that even if the NRC requires the use of the LVS and the NSTS as described above, that only a modest increase in safety and security could result as a nefarious licensee would still be able to acquire risk significant quantities of RAM via aggregation of Category 4 (or Category 5) quantities of RAM.

Question 4: Is there anything else we should consider as part of our evaluation of including Category 3 sources in the NSTS?

Response: No.

3. Specific Questions for Licensees Related to License Verification

Question 1: It currently takes approximately one month to get credentialed to access the LVS. If you currently do not have online access to LVS, and NRC establishes new requirements for license verification involving Category 3 quantities of radioactive material, would you be inclined to sign up for online access, or would you use alternative methods for license verification such as emailing the NRC Form 748 ''Manual License Verification Report'' to the LVS Help Desk or calling the license-issuing regulatory authority directly?

Response: The Group notes that certain members of the group would consider becoming credentialed to use the LVS so long as the NRC allows sufficient time for licensees which choose to become credentialed to do so prior to requiring that those licensees use the LVS to verify the proposed transferee's license. The Group provides the following observations.

- First, the fact that it takes one month to become credentialed to use the LVS is not a concern to the Group.

- Second, the Group does not fully understand the phrase, "and NRC establishes new requirements for license verification involving Category 3 quantities of radioactive material." We assume that the NRC is asking whether, if the NRC ultimately requires license verification in accordance with 10 C.F.R. 37.71, a licensee which does not currently have access to the LVS would apply for access or use alternative methods for license verification. Based on that assumption, we again note that the use of the LVS and the NSTS to lessen the risks associated with the aggregation of RAM by a nefarious licensee is only meaningful when both the LVS and the NSTS are maintained perfectly current. We believe that, unless the NRC was able to process the license verification

requests in real time, the delay associated with the use of the NRC Form 749[8] could, on one hand, prevent the transfer of RAM that would be authorized absent a delay, and on the other hand, allow a transfer of RAM to a nefarious licensee that would be prevented absent the delay.

Question 2: Approximately how many transfers involving Category 3 quantities of radioactive material do you do monthly? What percentage involves transfers directly to/from a manufacturer?

Response: The Group notes that the number of transfers of Category 3 quantities of RAM per period varies widely depending on the nature of the licensee and that licensee's business, among other factors. The Group understands that some licensees regularly conduct 10-30 such transfers per month and that other licensees conduct fewer than a single such transfer per month. Further, the Group understands that the majority of the transfers of Category 3 quantities of RAM that are not associated with storage or disposal are transfers to or from a manufacturer or distributor.

Question 3: Should license verification be required when transferring to an established manufacturer?

Response: The Group believes that a transferor of Category 3 quantities of RAM should verify the proposed transferee's license prior to transferring the material. The Group further believes that the NRC's current regulations regarding the verification of a proposed transferee's license rightly recognize the different risks to public health and safety arising from each category of RAM. The Group provides the following observations.

Question 4: Do you have online access to LVS? If so, have you experienced any issues with the LVS? Do you have any recommendations on how to improve LVS?

Response: No member of the Group has access the LVS; therefore, the Group cannot comment on the operability of the LVS.

4. Specific Questions for Licensees Related to the NSTS

Question 1: It currently takes approximately one month to get credentialed to access the NSTS. If you currently do not have online access to the NSTS and NRC establishes new requirements for the tracking of Category 3 sources in the NSTS, would you be inclined to sign up for online access or would you use alternative methods for NSTS reporting such as emailing or faxing the NRC Form 748 "National Source Tracking Transaction Report" to the NSTS Help Desk?

Response: The Group notes that certain members of the group would consider becoming credentialed to use the NSTS so long as the NRC allows sufficient time for licensees which

[8] We note that the "Manual License Verification Report" is NRC Form 749, and not NRC Form 748 is identified in the NRC's question.

choose to become credentialed to do so prior to requiring that those licensees use the NSTS to track Category 3 sources. The Group provides the following observations.

- First, the fact that it takes one month to become credentialed to use the NSTS is not a concern to the Group.

- Second, the Group does not fully understand the phrase, "and NRC establishes new requirements for the tracking of Category 3 sources in the NSTS." We assume that the NRC is asking whether, if the NRC ultimately requires the use of the NSTS to track Category 3 sources, a licensee which does not currently have access to the NSTS would apply for access or use alternative methods for reporting transfers, such as emailing or faxing the NRC Form 748 to the NRC. Based on that assumption, we again note that the use of the LVS and the NSTS to lessen the risks associated with the aggregation of RAM by a nefarious licensee is only meaningful when both the LVS and the NSTS are maintained perfectly current. We believe that, unless the NRC was able to process the license verification requests in real time, the delay associated with the use of the NRC Form 748 could, on one hand, prevent the transfer of RAM that would be authorized absent a delay, and on the other hand, allow a transfer of RAM to a nefarious licensee that would be prevented absent the delay.

Question 2: Do you have online access to the NSTS? If so, have you experienced any issues with the NSTS? Do you have any recommendations on how to improve the NSTS?

Response: No member of the Group has access the NSTS; therefore, the Group cannot comment on the operability of the NSTS.

SPECIFIC RESPONSES TO NRC'S "OTHER QUESTIONS"

Question 1: Should physical security requirements for Category 1 and 2 quantities of radioactive material be expanded to include Category 3 quantities?

Response: The Group believes that the NRC should not expand the physical security requirements for Category 1 and 2 quantities of radioactive material to additionally include Category 3 quantities of byproduct material. The Group offers no comment as to the desirability of expanding the physical security requirements for Category 1 and 2 quantities of radioactive material to additionally include Category 3 quantities of source material or special nuclear material. The Group provides the following observations.

- First, and as noted above, the Group believes that, because the NRC's current regulations reflect significant evaluation by the IAEA, the NRC itself, and by the Task Force, and because the bases of those evaluations and their conclusions are currently valid, the NRC should not revise its regulations regarding the security and accountability of Category 3 quantities of byproduct material.

- Second, to the extent that the NRC's current interest in the potential strengthening of the physical security requirements for Category 3 quantities of RAM was precipitated by the GAO's investigation, the Group observes that the GAO did not identify any weakness in any of the requirements – or the application of those requirements – related to any category of RAM.

- Third, the Group notes that, to the extent that the physical security of RAM is to prevent the loss and / or theft of that material, there have been very few cases of loss or theft in the United States or abroad. Representatively:

    - In 2012, ten significant events occurred involving the loss of Category 1, 2, and 3 sources. No Category 1 sources, three Category 2 sources, and seven Category 3 sources were lost, all of which were subsequently recovered, with the exception of one Category 3 source. The unrecovered Category 3 source was in a cardiac pacemaker that was buried with the deceased patient.[9]

    - In 2013, four significant events occurred involving the loss of Category 1, 2, and 3 sources). No Category 1 sources, ten Category 2 sources, and two Category 3 sources were lost, all of which were subsequently recovered.[10]

    - In 2014, eight significant events occurred involving the loss of Category 1, 2, and 3 sources. No Category 1 sources, five Category 2 sources, and three Category 3 sources were lost, all of which were subsequently recovered.[11]

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[9] Nuclear Material Events Database, Annual Report, Fiscal Year 2012 (February 2013) at xi, *providing also* "[a]ll three of the Category 2 events involved radiography exposure devices: one was lost during transportation from a job site, one was stolen from a parked truck, and the other was lost during shipment. Three of the seven Category 3 events involved the incorrect receipt of radioactive material at medical facilities; the sources were left uncontrolled for a period of time. Two of the Category 3 events involved items (a radiography exposure device and a well logging source) that were lost during transportation from jobsites. The other two Category 3 events involved cardiac pacemakers in deceased patients; one was retrieved by the funeral home before burial and the other was buried."

[10] Nuclear Material Events Database, Annual Report, Fiscal Year 2013 (March 2014) at xi, *providing also* "[t]wo events involved the loss (and subsequent recovery) of all ten Category 2 sources (radiography sources). The sources were lost by a common carrier during shipment from a radiography source manufacturer. Two events involved the loss (and subsequent recovery) of the Category 3 sources. In the first event, a brachytherapy source was delivered to a medical facility on a Friday during non-business hours. The source remained in an unrestricted shipping/receiving area over the weekend. In the other event, a common carrier delivered a brachytherapy source to the wrong licensee

[11] Nuclear Material Events Database, Annual Report, Fiscal Year 2014 (February 2015) at xi, *providing also* "[f]ive events involved the loss (and subsequent recovery) of the Category 2 sources (radiography sources contained within exposure devices). Two of the devices were left unattended at temporary jobsites, one device was lost after being left on the bumper of a truck that was driven away, one device was lost when a tornado ripped the darkroom off of a radiography truck, and one device was lost by a common carrier during shipment. Three events involved the loss (and subsequent recovery) of the Category 3 sources. Two events involved common carriers delivering brachytherapy sources to the wrong addresses. On the remaining event, a plutonium-powered pacemaker was sent to a licensee that was not licensed to possess the device.

- In 2015, fourteen significant events occurred involving the loss of 15 Category 1, 2, and 3 sources. Two Category 1 sources, nine Category 2 sources, and four Category 3 sources were lost; all of which were subsequently recovered except one Category 3 source. [12]

  Thus, there have been no reported instances of the theft of any Category 1, 2, or 3 source in the last four years. Similarly, all of the sources which have been lost or abandoned in the last four years have been either recovered or were buried underground.

- Fourth, the Group notes that none of the three Task Force reports issued to date have identified any weakness in the physical security requirements associated with Category 3 quantities of RAM.

- Finally, the group notes that, should the NRC revise its regulations to apply the physical security requirements for Category 1 and 2 quantities of byproduct material to also apply to Category 3 quantities of byproduct material, the cost of complying with those requirements is likely to be very high for many licensees. The actual cost of complying with those requirements varies depending on the amount of RAM a licensee might possess, the number and locations of the RAM storage locations at which the licensee possess the material, the manner in which a particular licensee uses the material, the manner in which the NRC proposes to determine whether a licensee possesses a Category 3 quantity of RAM (e.g., the use of the unity rule, or a similar rule), and on the manner in which the NRC defines the potential for several Category 4 sources (for example) to be aggregated. For example, whereas the cost associated with complying with these expanded regulations might be manageable for a licensee who is licensed to possess a single category 3 source at a single location to which only one person has access, the cost to the operator of a refinery could be extremely significant, as refineries are enormous complexes (which could be treated as a single storage location by the NRC) at which many Category 3 sources might be located, and to which many people might have access. The Group recommends that the NRC conduct significant outreach to licensees in a variety of industries to better understand the cost associated with complying with

[12] Nuclear Material Events Database, Annual Report, Fiscal Year 2015 (March 2016) at xi, *providing also* "[t]wo events involved the loss (and subsequent recovery) of Category 1 sources (containers of Ir-192 source wafers/disks) during shipment by common carrier. Eight events involved the loss (and subsequent recovery) of Category 2 sources. Six of the events involved radiography devices; three devices fell from trucks en route to jobsites, two devices were left unattended by the radiographers, and one device was in a truck that was stolen. The seventh event involved the loss of two radiography sources during shipment by common carrier. The eighth event involved the abandonment of an irradiator during an eviction process. Four events involved the loss (all but one source were subsequently recovered) of Category 3 sources. Two of the events resulted from errors during shipment by common carrier. One event involved a well logging source that fell from a truck en route from a jobsite. The fourth event involved a plutonium powered pacemaker that was buried with a deceased patient; this source was not recovered. A fifteenth significant event occurred prior to Fiscal Year 2015 and was recently added to NMED. This event involved the receipt of a Category 3 brachytherapy source at a hospital on a holiday weekend; no authorized user was present. The source was not placed into a controlled area for several days.

revisions to the NRC's regulations regarding the physical security of Category 3 quantities of RAM.

Question 2: Some Category 3 sources are covered under a general license (10 CFR 31.5). Should the NRC consider establishing maximum quantities in general licensed devices, thereby reserving authorization to possess Category 1, 2, and 3 quantities of radioactive material to specific licensees?

Response: The Group believes that the NRC should not establish maximum quantities in general licensed devices, thereby reserving authorization to possess Category 1, 2, and 3 quantities of radioactive material to specific licensees. The Group provides the following observations.

- First, and as noted above, the Group believes that, because the NRC's current regulations reflect significant evaluation by the IAEA, the NRC itself, and by the Task Force, and because the bases of those evaluations and their conclusions are currently valid, the NRC should not revise its regulations regarding the activity permitted in generally licensed devices.

- Second, to the extent that the NRC's current interest in revising its regulations regarding the activity permitted in generally licensed devices was precipitated by the GAO's investigation, the Group observes that the GAO did not identify any weakness in any regulation regarding general licenses (generally) or generally licensed devices (specifically), including, but not limited to, the maximum activity permitted to be present in a generally licensed device.

- Finally, should the NRC revise its regulations to provide that a generally licensed device may only possess less activity than the Category 3 / 4 threshold activity for a particular isotope, licensees which currently use devices with Category 3 quantities of byproduct material would be required to become specific licensees. Representative costs for those companies to become specific licensees are provided in Table 1, above. The Group notes that many licensees in the oil & gas and petrochemical industries conduct activities with Category 3 quantities of byproduct material in generally licensed devices in several states. Licensees which operate those devices in several states would, presumably, be required to become specific licensees in each of the states in which they operate. Thus, those companies would be required to bear some portion of the costs provided in Table 1, above, several times over.

CONCLUSION

After significant consideration, the Group believes that the NRC should not revise its regulations regarding the security and accountability of Category 3 quantities of byproduct material