UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 19, 2017

Mr. Jayant Bondre
Vice President, Chief Technical Officer
TN Americas LLC
7135 Minstrel Way, Suite 300
Columbia, MD 21045

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR REVIEW OF TN AMERICAS LLC APPLICATION FOR AMENDMENT NO. 15 TO STANDARDIZED NUHOMS® CERTIFICATE OF COMPLIANCE NO. 1004 FOR SPENT FUEL STORAGE CASKS, REVISION 0 (CAC NO. 001028, DOCKET NO. 72-1004, EPID: L-2017-LLA-0012)

Dear Mr. Bondre:

By letter dated March 28, 2017, TN Americas LLC submitted to the U.S. Nuclear Regulatory Commission (NRC) an application for Amendment No. 15 to the Standardized NUHOMS® Certificate of Compliance No. 1004 for Spent Fuel Storage Casks, Revision 0, pursuant to the requirements of Part 72 of Title 10 of the *Code of Federal Regulations*.

The staff has determined that further information is needed to complete its technical review. The request for additional information is in the enclosure. Your response should be provided within 30 days of the date of this letter. If you are unable to meet this deadline, please notify us in writing, at least one week in advance, of your new submittal date and the reasons for the delay. The NRC staff will then assess the impact on the current date (February 2018) to finalize the safety evaluation report and notify you of a revised schedule.

Please reference CAC No. 001028, Docket No. 72-1004, EPID: L-2017-LLA-0012 in future correspondence related to the review for this licensing action. If you have any questions, please contact me at (301) 415-6825.

Sincerely,

/RA/

Christian Jacobs, Senior Project Manager
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

CAC No.: 001028
Docket No.: 72-1004
EPID: L-2017-LLA-0012

Enclosure:
RAI (non-proprietary)

Request for Additional Information (non-proprietary)

By letter dated March 28, 2017, TN Americas LLC (TN) submitted to the U.S. Nuclear Regulatory Commission (NRC) an application for Amendment No. 15 to the Standardized NUHOMS® Certificate of Compliance No. 1004 for Spent Fuel Storage Casks, Revision 0, pursuant to the requirements of Part 72 of Title 10 of the *Code of Federal Regulations* (10 CFR 72).

This request for additional information (RAI) identifies additional information needed by the NRC staff in connection with its review of this amendment application. Each individual RAI describes information needed by the staff to complete its review of the application and to determine whether the applicant has demonstrated compliance with the regulatory requirements.

<u>Thermal Evaluation</u>

The main parameters of consideration in this particular evaluation are cladding and component temperatures and canister average helium temperature used to calculate canister pressures. The questions below are formulated based on these evaluation parameters.

4-1 Clarify the following statement in Section M.4.12.2.1, pp. M4-51f:

*For **<u>off-normal condition</u>**, with 8 FFCs in HLZC#2, the average temperature of helium is bounded by the limiting normal condition with ambient temperature of 100°F due to using sunshade for ambient temperature of 117°F.*

It is not evident from the final safety analysis report (FSAR) text why this statement is accurate given that text in a previous part of this section states:

*…, the normal transfer condition (100°F ambient) represents the bounding normal and **<u>off-normal condition</u>** for storage and transfer…*

AND

Boundary conditions for the limiting case (100°F ambient with insolation) with HLZC #2 are taken from Section M.4.4.1.8.

The staff cannot discern which of these statements is complete and correct for the purposes of calculating the average temperature of the helium in the Dry Shielded Canister (DSC) cavity used for pressure calculations.

This information is needed to determine compliance with 10 CFR 72.236(l).

4-2 Provide updated computer files for the ANSYS FLUENT sensitivity study of the 32PTH1 Type 1 DSC HLZC#6.

The ANSYS FLUENT computer files for the Standardized NUHOMS system were presented for the thermal analysis of the 32PTH1 Type 1 DSC with HLZC#5 and HLZC#6. Upon review of those files, the NRC staff was unable to review the results of the files contained in the compressed directories as they appeared to be corrupted. Specifically, the NRC Staff was unable to execute file ‘HSMH-32PTH1-TWOHALF-FULL-NORMAL-8000.DAT properly.

This information is needed to determine compliance with 10 CFR 72.236(l).

4-3 Provide additional FSAR text regarding the ANSYS FLUENT methodology used in performing the sensitivity analysis for HLZC#6.

The text of the Standardized NUHOMS FSAR repeatedly references sections of the NUHOMS EOS System when presenting the Computational Fluid Dynamics (CFD) modeling methodology used. In particular, Sections U.4.11.1.3, Methodology and U4.11.1.5, CFD Modeling do not have enough information, along with corrupted ANSYS FLUENT computer files identified above, to make a safety finding.

When making an incorporation by reference, the information being incorporated should be clear and specific information with a narrative describing how that specific information applies to the current amendment. The applicant should provide this narrative, which supports the conclusion that the method used in the NUHOMS EOS application is adequate to be used with the Standardized NUHOMS design to demonstrate that the peak cladding temperature and canister pressure remains within the design limits.

This information is needed to determine compliance with 10 CFR 72.236(l).

Shielding Evaluation

6-1 Clarify how the solar shield is used for *As Low As Reasonably Achievable (*ALARA) purposes.

The applicant states on page 10-32 of the safety analysis report (SAR):

“The solar shield while not required for transfer operations with ambient temperatures below 100 °F (106 °F for 32PTHJ) may also be used for ALARA purposes to protect the cask from rain or snow or other ambient conditions.”

The ALARA principle is designed to minimize the dose to radiation workers and the general public. It is not clear to the staff how protecting the cask from rain or snow is related to ALARA.

The staff needs this information to evaluate the shielding effectiveness of the TN Amendment No. 15 request with respect to demonstration of meeting the regulatory requirement 10 CFR 72.24(d)(2)(e).

6-2 Justify the proposed storage of up to 28 damaged fuel assemblies or 8 failed fuel cans is bounded by the 32PT Dry Shielded Canister (DSC) containing all intact fuel assemblies.

On the following pages of the SAR, the applicant states:

Page M.1-1:

“The NUHOMS-32PT System is designed to accommodate up to 32 intact, up to 28 damaged, or up to 8 failed fuel cans, with characteristics as described in Chapter M2.”

Page M.1-2:

“The NUHOMS®-32PT DSC system is designed to store intact and/or damaged and/or failed standard Pressurized Water Reactor (PWR) fuel assemblies with or without Control Components (CCs). The NUHOMS®-32PT DSC system is designed for a maximum heat load of 24 kW/canister and a maximum of 2.2 kW/assembly when heat load zoning is considered. The fuel which may be stored in the NUHOMS®-32PT DSC is presented in Section M.2. Provisions have been made for storage of up to 28 damaged fuel assemblies in lieu of an equal number of intact assemblies in cells, other than the four cells located at the center of the 32PT basket as described in Section M2. The DSC basket cells that store damaged fuel assemblies are provided with top and bottom end caps to assure retrievability. Provisions have also been made for storage of up to 8 [failed fuel cans] FFCs in cells located at the outside corners compartment cells of the 32PT basket as described in Chapter M2.”

Page M2.3a:

“The NUHOM System-32PT DSC is designed to accommodate up to a maximum of 8 failed fuel assemblies encapsulated in individual failed fuel cans (FFCs) and placed in cells located at the outer edge of the DSC as shown in Figure M2-2.”

In the previous Amendments Nos. 13 and 14, the maximum fuel assembly heat load was 1.2 KM/assembly and Maximum 24KW/canister without any damage fuel or failed fuel. In Amendment No. 15, the 28 damaged fuels can be stored in 32 PT with four (4) intact fuels in the center of the cask. Provide a detailed source term and dose rate calculation for the storage of up to 28 damaged fuels assemblies or up to 8 failed fuel cans stored in a 32PT cask.

The shielding analysis in the SAR does not include an analysis considering the potential for source redistribution for failed fuel, or any reference to the calculation package for failed fuel. The applicant needs to revise the SAR to include a shielding analysis for the 32PT cask with failed fuel configuration.

The staff needs this information to determine if the TN 32PT cask with the amended design meets the regulatory requirements of 10 CFR 72.236(a).

6-3 Provide justification for the various increases in the occupational exposure from the loading of 0.380 MTU fuel.

In the SAR statements or Table’s footnote the dose rates at different locations of the cask are increased by different scaling factors. There is no detail of how these factors are obtained. Provide the justification for all factors that are used in the SAR and effect of dose rate increase on site boundary dose rate.

The staff needs this information to determine the TN 32PT cask with the amended design meets the regulatory requirements of 10 CFR 72.236(a).

6-4 Justify the applicability of the isotopes used in code benchmarking for shielding analysis.

It is stated on Page P.5-7 in the SAR:

"Oak Ridge National Laboratory has benchmarked TRITON based on measured data from six different PWRs. This benchmarking is documented in NUREGICR-6968 [5.16}, NUREGICR-7012 [5.17], and NUREGICR-7013 [5.18} and includes measurement samples up to a burnup of 78.3 GWd/MTU. A summary of experimental samples utilized in the benchmark analysis is provided in Table P.5-27. The benchmark references show that TRITON computed results agree well with experiments, thus verifying the use of SCALE 6.0/ORIGEN-ARP to compute gamma and neutron source terms for high-burnup fuel (burnup ≤ 62 GW d/MTU). Because SAS2H and ORIG EN-ARP compute similar source terms for PWR fuel, the overall uncertainty in the gamma and neutron source terms developed above for SAS2H (±5% for gammas and ±11 % for neutrons) is also applicable to the SCALE 6.0/0RIGEN-ARP generated source terms."

The SAS2H is a diffusion theory code and TRITON is a transport theory code; therefore, benchmarking for TRITON code uncertainty is not applicable to SAS2H code uncertainty. The code benchmarking provided in NUREG/CR-7108 and NURG/CR-7109 are for isotopes considered for burnup credit. The group of isotopes for shielding source term is different than those considered for burnup credit. NUREG/CR-6700 provides ranking of isotopes that are important to the shielding and burnup credit. Provide a justification for applying the uncertainty from SAS2H code in the development of the source term.

The staff needs this information to determine the TN 32PT cask with the amended design meets the regulatory requirements of 10 CFR 72.236(a).

6-5 Provide justification for scaling factors used in the tables for loading 0.380 MTU FAs.

There is no justification for the scaling factors. Provide justification for how you arrive at these scaling factors.

The staff needs this information to evaluate the dose rates of the TN Amendment No. 15 request with respect to demonstration of meeting the regulatory requirements of 10 CFR 72.236(a).

6-6 Provide justification for using the 32PTH1 DSC response function for the 24 PTH DSC HLZC#6.

Page P.5-15 of the SAR stated:

"Because the original FQTs have been replaced with unified FQTs (Technical Specifications Tables I-3a through I-3p), the design basis source terms developed in Section P.5.2 are obsolete because they are based upon burnup, enrichment, and cooling time combinations that are no longer applicable. Therefore, SCALE 6.0/ORJGEN-ARP design basis source terms are developed based on the unified FQTs. The FQTs are documented in Section M5.2.6. The methodology used to develop the SCALE 6.0/ORIGEN-ARP design basis source terms for HLZC#2 is the same as described in Section P.5.2. The ANISN transfer cask and HSM response functions developed in Section P.5.2.4 are used to evaluate the source terms for each FQT burnup, enrichment, and cooling time (BECT) combination. The BECT combination that results in the maximum dose rate is selected as the design basis source. For HLZC#6, because the heat load zone configuration is not uniform, the three-zone 32PTH1 DSC response functions from Chapter U5, Tables U5-15 and U5-16, are used. Because the response functions are only used to rank the BECT combinations, using the 32PTH1 DSC response functions for the 24PTH DSC HLZC#6 is acceptable."

However, the applicant provides no justification for the applicability of the response function to the 24 PTH DSC HLZC#6. Provide the justification for using the three zone response functions for 32 PTH1 in the Tables U5-15 and 16 for 24PTH DSC HLZC#6 or develop a new response function for this specific cask loading configuration.

The staff needs this information to determine the TN 32PT cask with the amended design meets the regulatory requirements of 10 CFR 72.236(a).

6-7 Provide justification for an increase in the peak roof dose rates.

In the Page P.11-13 of the SAR stated that:

"P.11.2.3.4 Corrective Actions
The increase in the dose rates at the localized impact location following the missile impact accident is expected to be bounded by the dose rates at the HSM-H vents, calculated to be 1400 mrem/hour in Table P.5-1, since the structural analysis results demonstrate that there is no full penetration. This represents an increase in the peak roof dose rates by a factor greater than 20 and is conservative."

The applicant, however, provides no justification that the calculated 1400mrem/hour is bounding. The applicant needs to justify that using Horizontal Storage Module (HSM-H) vent dose rate bounds the roof top dose rate following a missile impact accident.

The staff needs this information to proceed with its review of the TN Amendment No. 15 request with respect to the demonstration of meeting the regulatory requirements of 10 CFR 72.236(d).

6-8 Provide the source terms and shielding calculation for the two new fuels, GNF-2 and ATRIM 11 and provide justification for Table T.2-3 and T.2-4 footnote.

In Table T.2-3:

"For ATRIUM 11 fuel assemblies, the U-235 wt. % enrichment is reduced by 0.55%."

And Table T.2-4:

"ATRIUM 11 fuel assemblies are authorized for storage only in the Type 2F basket with a maximum of 4 damaged intact fuel assemblies.
For ATRIUM 11 fuel assemblies, the U-235 wt. % enrichment is reduced by 0.55%."

The two new fuels GNF-2 and ATRIM-11 are added as authorizes content. There is no justification that if these fuels are bounded with any previous fuels authorized as content of 61BTH cask system. Provide the source term and shielding calculations for these new fuels, or if they bounded with any previous authorized contents. Justify the factors in the footnotes of the Tables T.2.3 and 4 that used ATRIUM-11 fuels.

The staff needs this information to determine the TN 32PT cask with the amended design meets the regulatory requirements of 10 CFR 72.236(a).

Criticality Evaluation

7-1 Revise the Safety Analysis Report (SAR) to clarify if Figure M.1-2 is applicable to both B_4C Poison Rod Assemblies (PRAs) and silver-indium-cadmium (AIC) PRAs, or B_4C PRAs only. If Figure M.1-2 is applicable only to B_4C PRAs, provide a separate figure showing the arrangement of AIC PRAs. In either case, provide a specification for the minimum AIC absorber material rod diameter.

Figure M.1-2 shows the layout and dimensions for PRAs to be used in the 32PT Dry Shielded Canister (DSC). However, it is not clear if this figure applies to B_4C PRAs only, or to both B_4C and AIC PRAs. The Figure should be revised to indicate which PRA types it is applicable to. If it is not intended to be applicable to the AIC PRA, a separate figure should be provided. In either case, the minimum AIC absorber material rod diameter should be specified. For B_4C PRAs, the minimum absorber material rod diameter is defined by the rod outer diameter and clad thickness dimensions, as the absorber material is B_4C powder which fills the entire clad interior volume. The AIC absorber alloy is a solid material, however, which will necessarily have a smaller diameter than that defined by the clad dimensions. The minimum diameter of AIC absorber material should be limited to the dimension shown to maintain the cask subcritical in the criticality analysis.

This information is needed to ensure that the Standardized NUHOMS® 32PT DSC will continue to meet the criticality safety requirements of 10 CFR 72.124.

7-2 Clarify the enrichment limits for damaged and failed fuel in Tables 1-1g2 and 1-1g3 of the Technical Specifications.

Tables 1-1g2 and 1-1g3 of the Technical Specifications for the 32PT DSC provide enrichment limits for damaged and failed fuel, but do not specify if these limits are only for damaged or failed fuel, or for all fuel, including intact fuel, loaded in the same DSC with damaged or failed fuel. These tables should be modified to clarify which assemblies these enrichment limits apply to. If the limit is different for the damaged or intact fuel loaded in the same DSC as failed fuel, or intact fuel loaded in the same DSC as damaged fuel, modify the Technical Specification tables to specify the enrichment limits appropriately.

This information is needed to ensure that the Standardized NUHOMS® 32PT DSC will continue to meet the criticality safety requirements of 10 CFR 72.124.

7-3 Clarify the amount of credit taken in the 32PT DSC criticality analysis for the silver content in the AIC PRAs, in relation to the amount of silver required per Note 3 of Table 1-1h of the Technical Specifications.

Section M.6 of the SAR states that 40% of the actual silver content is credited as being present, with 75% of that credited in the criticality analysis. However, Note 3 of Table 1-1h of the Technical Specifications specifies 2.46 grams of silver per centimeter of absorber rod in the AIC PRA. The footnote to Table M.2-4a of the SAR states that 75% of that value is credited in the criticality analysis. It is not clear how the minimum 2.46 grams per centimeter of absorber rod is determined, since it appears that, based on the dimensions in Figure M.1-2, this value represents roughly 44% of the density of elemental silver (at 10.49 g/cm3), or roughly 56% of the density of silver in typical 80% silver, 15% indium, 5% cadmium AIC alloys. Revise the SAR to state the expected density of absorber material in the AIC PRA, as well as the minimum diameter of absorber material in the rods of the AIC PRA. Note that conservatism in the modeling of AIC material is used to account for the lack of representative benchmark experiments with AIC material in the computer code validation analysis.

This information is needed to ensure that the Standardized NUHOMS® 32PT DSC will continue to meet the criticality safety requirements of 10 CFR 72.124.

7-4 Revise the application to demonstrate that the CE 15x15 fuel class is bounded by the WE 17x17 fuel class for damaged and failed fuel assemblies in the 32PT DSC.

Section M.6.4.4 of the SAR states that no explicit calculations are performed for the CE 15x15 fuel class for damaged or failed fuel configurations. The results from the WE 17x17 fuel class are conservatively applied for this purpose. However, the SAR does not demonstrate that the WE 17x17 fuel class bounds the CE 15x15 fuel class for these configurations. The application should be revised to supply this demonstration.

This information is needed to ensure that the Standardized NUHOMS® 32PT DSC will continue to meet the criticality safety requirements of 10 CFR 72.124.

7-5 Revise the failed fuel evaluation for the 32PT DSC in the SAR to consider smaller array sizes of fuel, representative of less than a full fuel assembly. Also, revise Technical Specifications Table 1-1g3 to specify enrichment limits in terms of the most limiting array size.

The failed fuel evaluation considers several array sizes of unclad fuel rods at optimum pitch. However, the failed fuel canister may contain any amount of fuel material up to the mass of a full fuel assembly, meaning that there may be much less material than evaluated. The system may be more reactive with a smaller array of less fissile material, at optimum pitch. Also, Technical Specifications Table 1-1g3 contains enrichment limits for fuel types based on the particular array sizes evaluated in the application. Since failed fuel has no requirements to be in or maintain a particular fuel geometry, it is unclear how a cask user would determine the array size for failed fuel. The enrichment limits for damaged fuel should be revised to be expressed in terms of a single, most reactive array size, which would not need to be verified prior to loading.

This information is needed to ensure that the Standardized NUHOMS® 32PT DSC will continue to meet the criticality safety requirements of 10 CFR 72.124.

7-6 Revise the SAR and Technical Specifications, as necessary, to clarify if failed fuel canisters may be stored in a 32PT DSC with both intact and damaged fuel. If failed fuel may be stored with both intact and damaged fuel, provide an analysis with a 32PT DSC containing both failed and damaged fuel to demonstrate that this configuration remains subcritical, and clarify which enrichment limits apply to this configuration.

Table 1-1e of the Technical Specifications states that up to eight failed fuel assemblies may be stored, with the remainder intact and/or damaged fuel assemblies, empty slots, or dummy assemblies. However, the criticality analysis in Section M.6 of the SAR only evaluates damaged fuel or failed fuel, without evaluating a mixture of both. Additionally, it is not clear which enrichment limit applies for the situation of mixed intact, damaged, and failed fuel. The SAR and Technical Specifications should be revised to clarify these enrichment limits.

This information is needed to ensure that the Standardized NUHOMS® 32PT DSC will continue to meet the criticality safety requirements of 10 CFR 72.124.

7-7 Revise the Technical Specifications for the 61BTH DSC to limit GNF2 fuel to the Type 1 and 2 DSC with A, C, and F basket types evaluated in the criticality analysis, or revise the criticality analysis to demonstrate that the Type 1 and 2 DSCs with B, D, and E basket types loaded with GNF2 fuel will be subcritical.

Section T.6 of the SAR states that GNF2 fuel criticality evaluations are performed for six configurations - Type 1 and 2 DSCs with A, C, and F basket types - to demonstrate that GE12 fuel assembly enrichment limits are applicable to GNF2 fuel. However, the Technical Specifications appear to show that the GE12 enrichment limits also apply to GNF2 fuel in Type 1 and 2 DSCs with B, D, and E basket types. The SAR should be revised to provide an analysis demonstrating that the GE12 enrichment limits are applicable to GNF2 fuel in Type 1 and 2 DSCs with B, D, and E basket types, or the Technical Specifications should be revised to limit GNF2 fuel to Type 1 and 2 DSCs with A, C, and F basket types.

This information is needed to ensure that the Standardized NUHOMS® 32PT DSC will continue to meet the criticality safety requirements of 10 CFR 72.124.

<u>Materials Evaluation</u>

8-1. Provide the drawings for the damaged fuel top and bottom end caps. Change #4 indicates that damaged fuel assemblies in the 32PT Dry Shielded Canister (DSC) are confined within top and bottom end caps and failed fuel assemblies loaded within individual failed fuel canisters. The amendment request included drawings for the transportable canister for pressurized water reactor (PWR) Fuel Failed Fuel

can assembly (NUH32PT-1007-SAR). The drawings for the end caps were not provided.

This information is necessary to assure compliance with 10 CFR 72.236(b) and 10 CFR 72.236(g).

8-2. Provide updated Final Safety Analysis Report (USFAR) change pages for Appendix M.8 Operating Systems that include a description of the loading and unloading operations for the 32PT DSC loaded with damaged fuel.

This information is necessary to assure compliance with 10 CFR 72.236(g).

8-3. Update the Technical Specifications Table 1-1e to include the following information in the definition of Fuel Damage: The extent of damage in the fuel assembly, including non-cladding damage, is to be limited such that a fuel assembly is able to be handled by normal means. The extent of damage in the fuel rods is to be limited such that a fuel pellet is not able to pass through the damaged cladding during handling and retrievability is ensured following normal and off-normal conditions.

The applicant provided this description of damaged fuel for the 32PT DSC in the UFSAR change pages in Section M2.1 Spent fuel to be stored.

This information is necessary to assure compliance with 10 CFR 72.236(g).

8-4. Provide additional information to clarify the handling of the damaged fuel using normal means. Specifically address the potential for fuel fragments smaller than the size of a pellet to be released from damaged fuel rods, during handling and retrieval operations, compliance with the criticality, shielding, thermal, and structural requirements, and normal handling and retrieval from the cask.

The applicant stated:

> *Damaged PWR fuel assemblies are assemblies containing missing or partial fuel rods, or fuel rods with known or suspected cladding defects greater than hairline cracks. The extent of damage in the fuel assembly, including non-cladding damage, is to be limited such that a fuel assembly is able to be handled by normal means. The extent of damage in the fuel rods is to be limited such that a fuel pellet is not able to pass through the damaged cladding during handling and retrievability is ensured following normal and off-normal conditions.*

The staff note that the applicants approach to storing damaged fuel is not consistent with the guidance in NUREG-1536 Revision 1 Section 8.6 C. Canning of Damaged Fuel which states that the purpose of a can designed for damaged fuel is to (1) confine gross fuel particles, debris, or damaged assemblies to a known volume within the cask; (2) to demonstrate that compliance with the criticality, shielding, thermal, and structural requirements are met; and (3) permit normal handling and retrieval from the cask.

This information is necessary to assure compliance with 10 CFR 72.236(g).

REQUEST FOR ADDITIONAL INFORMATION FOR REVIEW OF TN AMERICAS LLC APPLICATION FOR AMENDMENT NO. 15 TO STANDARDIZED NUHOMS® CERTIFICATE OF COMPLIANCE NO. 1004 FOR SPENT FUEL STORAGE CASKS, REVISION 0 (CAC NO. 001028, DOCKET NO. 72-1004, EPID: L-2017-LLA-0012), DOCUMENT DATE: October 19, 2017

DISTRIBUTION:
MLayton, SFM

Letter: G:/SFST/Jacobs/CoC 1004 Amendment 15/RAI – 1st Round/ CoC 1004 Amd 15 – RAI #1.docx

ADAMS Package No. ML17292A161

OFC:	DSFM	DSFM	DSFM	DSFM
NAME:	ABarto (via email)	EGoldfeiz (via email)	DDunn (via email)	JPitotter (via email)
DATE:	9/11/17	9/25/17	9/18/17	9/13/17
OFC:	DSFM	DSFM	DSFM	DSFM
NAME:	TTate (via email)	MRahimi (via email)	YDiaz-Sanabria (via email)	WWheatley (via email)
DATE:	9/26/17	9/14/17	9/28/17	10/18/17
OFC:	DSFM	DSFM	DSFM	DSFM
NAME:	C.Jacobs	JMcKirgan		
DATE:	10/18/17	10/19/17		

OFFICIAL RECORD COPY