

# JL SHEPHERD & ASSOCIATES

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71-9344  
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71-5939

**Note: Tables 1, 2 and 3 are marked both "Sensitive Information - Not For Public Disclosure" and "Security-Related Information - Withhold Under 10CFR2.390", the remainder of the request does not include sensitive or security-related information.**

August 27, 2008

ATTN: Document Control Desk  
Director, Division of Spent Fuel Storage and Transportation  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-001

Redacted copy to:  
ATTN: Special Permits, PHH-31  
Associate Administrator for Hazardous Material Safety  
Pipeline and Hazardous Materials Safety Administration  
U.S. Department of Transportation  
100 New Jersey Ave., S.E.  
Washington, D.C. 20590

NRC REGULATORY ISSUE SUMMARY 2008-18  
REQUEST FOR EXTENDING USE OF EXPIRING TRANSPORTATION PACKAGES.

JL Shepherd & Associates request for extension for limited use for expiring transportation packages effective October 1, 2008.

(1) Package Information:

- a) JL Shepherd & Associates current fleet of fourteen (14) U.S. Department of Transportation (DOT) Specification 20WC packages, maintained in accordance with JL Shepherd & Associates 10CFR71 Quality Assurance Program Plan, Approval 0122, Rev. 9, dated 12/22/2006. These DOT Specification 20WC packages subject to annual inspections are maintained and repaired under this Quality Assurance Program. Additionally, these packages have been the subject of inspection of the U.S. Nuclear Regulatory Commission's (NRC) Audits from 2001 to 2006 and a DOT inspection conducted in November 2001. The inspection results were favorable, in respect to the condition and maintenance of the packages.

NUS501

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(1) Package Information, continued:

a) continued

The applicable Specification 20WC packages are listed as follows:

20WC3, Serial Number: 22256  
20WC3, Serial Number: 22259  
20WC5, Serial Number: 22196  
20WC5, Serial Number: 22232  
20WC5, Serial Number: 22238  
20WC5, Serial Number: 22240  
20WC5, Serial Number: 22481  
20WC6, Serial Number: 22027  
20WC6, Serial Number: 22080  
20WC6, Serial Number: 22160  
20WC6, Serial Number: 22280  
20WC6, Serial Number: 22281  
20WC6, Serial Number: 22422  
20WC6, Serial Number: 22423

b) Rented transportation packages: Energy Solutions Model 10-142,  
Certificate of Compliance (COC) USA/9208/B( ),  
Serial Numbers to be determined at time of rental.  
JL Shepherd & Associates is a registered user of this package.

c) Rented transportation packages: General Electric – Hitachi Nuclear Energy Americas  
LLC, Model 1500, Certificate of Compliance (COC) USA/5939/B( )F  
Serial Numbers to be determined at time of rental.  
JL Shepherd & Associates is a registered user of this package.

(2) Identification of shipments:

a) Number of shipments.

The enclosed Tables 1 through 3 contain information pertaining to the number of shipments, as summarized below.

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(2) Identification of shipments, continued:

a) Number of shipments, continued.

The enclosed Tables 1 through 3 contain information pertaining to the number of shipments, as summarized below.

Please see Table 1 for a minimum of twenty-five (25) shipments using DOT Specification 20WC packages, per the list above, for confirmed orders through the 1st Quarter 2009.

Table 1 is marked both "Sensitive Information - Not For Public Disclosure" and "Security-Related Information - Withhold Under 10CFR2.390".

Please see Table 2 for a minimum of sixty (60) shipments using DOT Specification 20WC packages, per the list above, for orders currently pending or in negotiation through the 1st Quarter 2010.

Table 2 is marked both "Sensitive Information - Not For Public Disclosure" and "Security-Related Information - Withhold Under 10CFR2.390".

Please see Table 3 for a minimum of seven (7) shipments using either the DOT specification 20WC packages, per the list above or the COC USA/9208/B( ), Model 10-142, a minimum of four (4) shipments solely using COC USA/9208/B( ), Model 10-142 for orders currently pending or in negotiation through the 1st Quarter 2010, or for as long as Energy Solution's extensions are granted.

Table 3 also includes projected multiple shipments from General Electric Vallecitos Nuclear Plant to JL Shepherd and Associates or clients, using the COC USA/5939/B( )F Model 1500, for as long as General Electric's extension is granted, for orders currently pending or in negotiation through the 1<sup>st</sup> Quarter 2010.

Table 3 is marked both "Sensitive Information - Not For Public Disclosure" and "Security-Related Information - Withhold Under 10CFR2.390".

Note: In the interest of a more expeditious time schedule, it is possible that empty packages may be shipped from one client to another client without return to JL Shepherd & Associates, if the off-site package inspection determines that the package is undamaged.

b) The enclosed Tables 1, 2 and 3 contain information pertaining to the numbers of packages used per shipment to a licensee.

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(2) Identification of shipments, continued:

- c) Packaging serial numbers per shipment are not listed on enclosed Tables 1 through 3. The serial numbers for the JL Shepherd & Associates Specification 20WC packages are contained in (1) a) above. Since the 20WC5's and 20WC6's can be used interchangeably for multiple shipment uses, dependent upon the physical size of the inner package and the maximum gross weight permitted, to assign specific serial numbers to a shipment could cause shipment delays, if a specific package is damaged, quarantined for repairs, or specifically assigned to simultaneous shipments. The serial numbers for the rented transportation packages will be determined at time of rental.
- d) The enclosed Tables 1, 2 and 3 describe the package content by Curies and radionuclide. The contents are sealed sources, the majority meeting "Special Form" criteria.
- e) The enclosed Tables 1, 2 and 3 describe the end use of the radioactive material.
- f) The enclosed Tables 1, 2 and 3 describe shipment origin and destination by licensee. Specific addresses have been omitted.
- g) The mode of transportation will be motor freight for all shipments, using sole use transport vehicles, in accordance with increased controls and additional security measure orders.
- h) The general time frame for completion of Table 1 is 1<sup>st</sup> Quarter 1009. The general time frame for completion of Tables 2 and 3 is 1<sup>st</sup> Quarter 1010. This is expected to allow sufficient time for NRC review and approval of the new JL Shepherd & Associates Certificate of Compliance package application and to have new packages built after the approval. JL Shepherd & Associates reserves the right to make additions to the tables and time frames as the new package program approval time frame develops.
- i) The last date the shipment will be completed is dependent upon the new package approval and new package build time, dependent upon the success of the destructive prototype testing. The engineering analysis of the new JL Shepherd & Associates Certificate of Compliance package has determined a safety factor of 1.5 (71.73), and we have every confidence that the prototype will pass the destructive testing program.

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(3) Reasons for Requesting Extended Use.

a) Why acquiring replacement packages is not practical.

Per a RAMPAC (Radioactive Materials Packages) website search and contact with Energy Solutions and other Type B(U) package owners, the domestically approved packages available for shipment after 10/1/2008, for the type and quantity of radioactive material identified in (2) above, are:

Certificate of Compliance USA/9168/B, Model 8-120B

and Certificate of Compliance USA/9402/B ( )-85, Model 10-160B

- i) These packages must travel the highways on over wide, over weight tractor-trailers, which have many travel hour and route restrictions, with layovers to accommodate travel restrictions, which highly increases the risk profile to the public and for security measures.
- ii) These packages must be opened with a crane, for which the space required, may require street closures for the movement of the material from the facility to the truck staging location, creating a much higher risk profile to the public and for security measures.
- iii) Dependent upon the previous use of these packages, the residual contamination from by product or source material in the form of solids, dewatered resins or process solids or solidified waste in secondary containers, including fissile material, may require the receiving licensee to amend their licensees for temporary possession of radionuclides not normally associated with their licenses, which will delay the shipment scheduling.
- iv) JL Shepherd & Associates recommends air sampling when opening these packages, due to the potential release of non-fixed internal contamination at both the delivery and receiving sites.
- v) Contamination control measures need to be implemented for the possibility of external contamination to the devices and the sealed sources from the COC packages.

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(3) Reasons for Requesting Extended Use, continued:

a) Why acquiring replacement packages is not practical, continued

- vi) Due to the wattage restriction of these packages, multiple packages may need to be used for a single shipment, creating a much higher risk profile to the public and for security measures. For example, if three (3) or four (4) Specification 20WC packages are to be used for a single shipment, these packages can travel on the same single transport vehicle rather than on three (3) or four (4) over wide and over weight transport vehicles, reducing the transport risk.

b) Why shipments cannot be made before the October 1, 2008 expiration date.

All attempts will be made to make as many shipments from Table 1 as possible by October 1, 2008 by JL Shepherd & Associates. In the interest of a more expeditious time schedule, it is possible that empty packages may be shipped from one client to another client without return to JL Shepherd & Associates, if the off-site package inspection determines that the package is undamaged.

Delays have occurred and will occur due to:

- i) Weather conditions not conducive to safe transport: i.e. currently hurricanes, tropical storms, tornado watches, fires, flooding, and other natural weather events.
- ii) Shipment restrictions due to the Republican and Democratic Presidential Conventions and other high risk events as determined by the USNRC.
- iii) Receiving licensees not yet meeting Increased Control requirements for security to receive the shipments.
- iv) Receiving licensees' building construction projects not completed, and no viable on-site storage meeting Increased Controls requirements
- v.) Receiving licensee's licenses not yet finalized,

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(3) Reasons for Requesting Extended Use, continued:

v.) Receiving licensee's licenses not yet finalized,

- vi) Receiving licensee has not finished characterizing replacement calibration ranges, so obsolete material is still in use.
- vii) Unscheduled and unanticipated delays by sealed source vendors for delivery of new sources required for the devices to be delivered by JL Shepherd and Associates, as listed in Table 1.
- viii) The numbers of the current JL Shepherd & Associates' 20WC fleet of packages is insufficient to make all shipments by October 1, 2008, combined with the regulatory prohibition to manufacture new 20WC packages since January 2004, per NRC and DOT rulemaking.
- ix) The systemic and endemic Nuclear Industry problem of the "graying" or retirement and attrition of professionals capable of the support systems required for the preparation and use of these packages.
- x) Implementation of NRC's Order EA-08-212.
- xi) Increases to the Department of Homeland Security threat level, as now undetermined and dependent upon intelligence of a credible threat.
- xii) Licenses of clients to receive the shipments per Tables 1, 2 and 3 typically do not include the residual isotopes contained in the rental packages available, per 3) above, and temporary licenses may need to be issued before receipt, dependent upon contamination levels.
- xiii) Staff, including those personnel involved with the shipments, per Tables 1, 2 and 3, working with various Federal agencies on additional security measures for radionuclides of concern.

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(3) Reasons for Requesting Extended Use, continued:

Contents cannot be reconfigured such that transport can be conducted in accordance with the regulations.

- i) A single special form or sealed source contained in the shipments contained in Tables 1, 2 or 3 are above a Type A<sub>1</sub> quantity of radioactive materials and cannot be reconfigured to meet the criteria of 54.1 Curies per source for Cesium-137 or 10.8 Curies per source for Cobalt-60, without destruction of the source capsule for re-encapsulation of the radionuclides, which results in extreme risk of major contamination to the public and all licensees involved. We are not aware of any license, including JL Shepherd & Associates, that permits deliberate on-site destruction of a viable source for re-encapsulation of the material into smaller sources for shipment. This work requires a licensed hot cell facility. In our opinion, bringing a portable hot cell facility to a licensee's facility, if it is possible, increases the risk to the general public and significantly raises the security profile of the activity. We also doubt that any current non-nuclear power licensee is eligible for the Price Anderson nuclear pollution insurance coverage to cover the generation of the amount of contamination associated with this destruction and re-encapsulation process.
  
  - c) The transport schedule cannot be adjusted so as to be conducted in accordance with the regulations.
- Please see 3), (a) and (b) above.
- d) Good faith efforts to acquire replacement packages that meet current package performance requirements and status.

JL Shepherd & Associates is actively engaged in the process of developing a replacement package for the shipment of sealed sources. This process formally started in June 2005, with the initial selection of an engineering team.

- i) JL Shepherd & Associates met with the NRC on August 2, 2006 to discuss concepts for the new JL Shepherd & Associates Certificate of Compliance package for the shipment of sealed sources.

- d) Good faith efforts to acquire replacement packages that meet current package performance requirements and status, continued
  - ii) From the time of the concept approval to final prototype design, including finding and approving a 10CFR71 approved vendor for prototype package manufacture took twenty-two (22) months.
  - iii) A purchase order was let in September 2007 for the prototype package; however audit response and audit corrective actions from the 10CFR71 licensed package manufacturer and final design adjustments delayed completion of the prototype packages until July 2008.
  - iv) Destructive prototype testing of the prototype package is due to start on September 5, 2008.
  - v) Certificate of Compliance submittal to the NRC, based upon testing results and modeling for anticipated requests for ensuing information as part of the package submittal is estimated to be made in the relatively near future.
- e) Adverse impacts that will result if the shipment is not conducted.
  - i) For decommissioning of obsolete materials, the adverse impact would be that the material would need to remain on-site at the licensees' location for an unknown time duration, subjecting the obsolete material, the licensee and the general public to additional risk.
  - ii) For the delivery of new sources/devices, the majority of these shipments involve either direct or indirect tax dollars, or federal appropriations, funding for which may not be subject to delays of an unknown duration.
  - iii) For deliveries of new sources/devices, especially in the biomedical and medical research areas and in the aerospace areas, the economic impact cannot be calculated, including the loss to the gross national product for delays of unknown duration.

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(4) Safety Justification for Continued Use and Proposed Compensatory Measures.

- a) Special package inspections, tests or demonstrations that ensure that the packaging is in unimpaired physical condition.
  - i) The JL Shepherd & Associates fleet of DOT Specification 20WC packages are subject to annual inspections, are inspected prior to every shipment and are maintained and repaired under the JL Shepherd & Associates 10CFR71 Subpart H Quality Assurance Program. Additional inspections are not required, as these packages currently are in an unimpaired physical condition.
  - ii) Additional testing or demonstrations will not be required.

The DOT Specification 20WC packages were subjected to many of the current test requirements by Sandia National Laboratories, as documented in the Sandia Report SC-RP-65-98, pages 141-156. Copies of this Report available upon request. The Atomic Energy Commission requested that Sandia Corporation help in the development of containers for shipping radioactive materials that would withstand the testing listed below and to assist in the subsequent formulation of appropriate regulations. This testing program was the development of the current DOT specification 20WC packages.

Testing parameters included:

- a thirty foot (30') free fall to an unyielding surface. Tests included one (1) four thousand (4000) pound container being dropped three (3) times, once at 45°, once on a side and once on an end. There were a total of ten (10) drop tests performed on eight (8) prototypes. The 20WC prototype survived the drop tests in a suitable condition for the fire test to be performed.
- A forty inch (40") drop onto a six inch (6") diameter by eight inch (8") long carbon steel spike, with the container positioned to cause maximum damage in both drops. This test was not performed in the report test sequence. Sandia did note that "meeting this requirement is not considered to be a problem).

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(4) Safety Justification for Continued Use and Proposed Compensatory Measures, continued.

a) Special package inspections, tests or demonstrations that ensure that the packaging is in unimpaired physical condition, continued.

- An ASTM standard one (1) hour fire. An open pit petroleum fire, using JP-4 jet fuel, a more extreme test than that required by the ASTM standard curve. The fire tests confirmed earlier conclusions that “the superior performance of fir plywood laminated shells in protecting an inner ICC-55 or similar container from the rigors of a sever accident.”
- A twenty-four (24) hour submersion of the container in water to a depth of three feet (3’) over the uppermost portion of the container without leakage of the contents or the loss of any shielding. As of the time this report was generated, “The water submersion criterion has, with the exception of one test, been largely ignored, because the development concept of this shipping container was an outer shell protecting an inner container from essentially all effects of shock and fire. If this is done, a water-tight seal on the inner container is a simple matter to maintain.”

While Sandia did not specifically address the forty inch (40”) drop onto a spike or peg and specifically did not address the water test, except to require a water tight seal on the inner container, the NRC’s January 1999 TIP:30 Transport of Radioactive Materials states that “The excellent safety record developed over more than 30 years during which millions of radioactive materials shipments have been made without identifiable injury or death attributable to radiological causes. In addressing the adequacy of safety standards “In 1981, the NRC reevaluated its regulations concerning transportation of radioactive materials and concluded no immediate changes were needed to improve safety (Ref.NUREG-0170).” This assessment was based upon a package design to withstand “a series of impact, puncture and fire environs, thereby providing a reasonable assurance that packages will withstand serious transportation accidents. The DOT Specification 20WC’s were a part of the currently approved transport containers at that time. In the nine years since the TIP:30 was written, there has been no identifiable injury or death attributable to

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(4) Safety Justification for Continued Use and Proposed Compensatory Measures, continued.

- a) Special package inspections, tests or demonstrations that ensure that the packaging is in unimpaired physical condition, continued.

radiological causes due to a transportation accident involving the use of Specification 20WC packages.

The Sandia Report was used for the development of the regulations governing the DOT Specification 20WC packages. In regard to the immersion test, the inner packages for the Specification 20WC package evolved into the Type A or Specification 7A package concept, which includes a water test as part of that package testing protocol, per 49CFR173.465. The Specification 7A packages in Tables 1, 2 and 3 do not contain liquids or gasses. The Specification 7A package contains a "Special Form" capsule which is also subjected to leak tightness testing, per 49CFR173.469. The Specification 7A packages used by JL Shepherd & Associates are typically a steel shell or mold containing lead (or lead equivalent) biological shielding and a Special Form source. This combination of inner packaging is impervious to water. The other approved inner package is a Specification 2R inside containment vessel, which must "be made of stainless steel, malleable iron, or brass or other material having the equivalent physical strength or fire resistance" per 49CFR178.360

- b) Transport by exclusive use.

- i) The transport indexes, the external surface readings, the radionuclides and Curie contents for the shipments in Tables 1, 2 and 3 will be significantly below the exclusive use criteria for shipments (200 mrem/hr not to exceed 1000 mRem/hr at the surface of the package, per 49CFR173.441), based upon comparison of similar type shipments. Historically, similar type shipments have not exceeded a Transport Index of 10 and JL Shepherd & Associates does not expect the shipments in Tables 1, 2, and 3 to exceed this level. All shipments are below Highway Route Control Quantity; the one exception is the delivery of new Cobalt-60 source inventory from the supplier to JL Shepherd & Associates. JL Shepherd & Associates will commit to shipping the Specification 20WC packages, and the COC packages contained in Tables, 1, 2 and 3 using an "exclusive use", "sole

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(4) Safety Justification for Continued Use and Proposed Compensatory Measures.

b) Transport by exclusive use, continued.

use” or “full load” (as defined in 49CFR173.403) mode of motor transport. The “sole use” terminology will be used to differentiate between the two types of “exclusive use” shipments. The shipments include the use of either closed transport or flat bed style transport vehicle. The package is secured within or on the sole use transport vehicle so that its position remains fixed during transportation. There will be no loading or unloading operations performed between the beginning and end of the transportation using sole use vehicles, and work will be performed under the direction of the shipper or receiver. Radiologically trained personnel will perform loading and unloading operations. Resources for safe handling of the shipment will be provided. Specific written instructions, in addition to the shipping papers, are provided to the carrier that provide for actions to avoid unnecessary delays or unnecessarily result in increased radiation levels or radiation exposures to transport workers or members of the general public. These written instructions also contain the instructions required for Radioactive Materials Quantity of Concern shipments, with additional security measures, which cannot be discussed in this application.

- ii) The shipment of empty packages, specifically empty Specification 20WC packages, will be exempt from this sole use transportation vehicle requirement. The JL Shepherd & Associates' Specification 20WC packages contain no residual radioactivity. They have been only used to transport sealed sources, the vast majority of which meet "Special Form" criteria, either to clients or for return to JL Shepherd & Associates. The Specification 7A or 2R inner packages (approved contents) which contain the sealed sources are free of contamination by a contractual process.

c) Transport during time of low road usage.

- i) Transport schedules are dependent upon the amount of time it takes to prepare, load and secure the shipment on the transport vehicle. Best efforts will be made to start a shipment in off rush hour traffic at the various locations.

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(4) Safety Justification for Continued Use and Proposed Compensatory Measures.

c) Transport during time of low road usage, continued.

During transit for sole use vehicles carrying Radioactive Materials Quantity of Concern shipments, there are travel restrictions which cannot be discussed in this application.

d) Accompaniment by escort equipped to affect a recovery in an emergency situation or in case of a transportation accident.

- i) A hazardous materials recovery escort for the sole use transport vehicle may not be possible to implement. A private escort would not have the first responder credentials for each state through which the shipment passes, nor would have the local law enforcement and emergency responder support. For Radioactive Materials Quantities of Concern, there is a notification process in place, which cannot be discussed in this application. Per NRC Order EA-08-212, which has appeared on the public docket in a redacted version, but has to date not been received by JL Shepherd & Associates, all quantities of the radioactive material covered on Tables 1, 2 and 3 would be subject to this notification process. The state agencies have the discretion and option as part of this process to provide escorts for shipments. At present there is a higher threshold for Radioactive Materials Quantities of Concern. In the interim, JL Shepherd & Associates will use this process for all shipments listed in Tables 1, 2 and 3. JL Shepherd & Associates would like to note that per 4) (a) ii) above, that in over 40 years of transport there has been no injury or death attributable to radiological causes due to a transportation accident, per TIP:30, involving the use of Specification 20WC packages and that the JL Shepherd & Associates fleet of Specification 20WC packages have been scrupulously maintained in accordance with a 10CFR71 Subpart H Quality Assurance Program.

(5) Plan and Schedule to Acquire Replacement Packages or Complete Necessary Shipments.

- i) Please see 3) (d) above for status on JL Shepherd & Associates replacement package schedule for the shipment of sealed sources.

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Copies of all reports referenced in this request for extension are available upon request.

JL Shepherd and Associates welcomes this opportunity to enter into a dialog with both the NRC and the DOT on the extension for limited use for expiring transportation packages.



J.L. Shepherd, President



William H. Brown, Quality Assurance Manager

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# JL SHEPHERD & ASSOCIATES

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August 27, 2008

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U.S. Department of Transportation  
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Copy to:  
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Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-001

APPLICATION FOR U.S. DEPARTMENT OF TRANSPORTATION SPECIAL PERMIT  
PER NRC REGULATORY ISSUE SUMMARY 2008-18  
REQUEST FOR EXTENDING USE OF EXPIRING TRANSPORTATION PACKAGES.

JL Shepherd & Associates request for a Special Permit for the extension for limited use for  
expiring transportation packages effective October 1, 2008.

Company Information:

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APPLICATION FOR U.S. DEPARTMENT OF TRANSPORTATION SPECIAL PERMIT  
PER NRC REGULATORY ISSUE SUMMARY 2008-18

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Description of Special Permit Proposal.

(1) The citation of the specific regulation from which the applicant seeks relief.

JL Shepherd & Associates in this application, seeks relief through the Special Permit process from the U.S. Nuclear Regulatory Commission (NRC) final rule in the Federal Register (69 FR 3698), amending its transportation regulations in Part 71, to be compatible with the latest version of the International Atomic Energy Agency (IAEA) "Regulations for the Safe Transport of Radioactive Material". This rulemaking, coordinated by both the U.S. Department of Transportation (DOT) and the NRC implemented a planned phase out of Type B radioactive materials packages which did not meet the requirements of the 1996 edition of IAEA regulations TS-R-1. The expiration date effective October 1, 2008 is for both NRC previously approved Type B radioactive materials packages not designated as B(U), B(M) B(U)F or B(M)F before September 6, 1983 per 10CFR71.19 and for existing DOT Type B Specification 6M, 20WC or 21WC packages conforming to 49CFR Subchapter C, as authorized by 10CFR71.20 and 49CFR Parts 173 and 178.

This application for Special Permit relates specifically to the fleet of JL Shepherd & Associates owned and maintained DOT Specification 20WC packages and is made simultaneously and in conjunction with the NRC Regulatory Issue Summary (RIS) 2008-18, issued August 14, 2008 for domestic shipments.

It also our intent to ask to be added as registered users for rented transportation packages; i.e. Energy Solutions Model 10-142, Certificate of Compliance (COC) USA/9208/B( ), (JL Shepherd & Associates is currently a registered user of this package) and General Electric – Hitachi Nuclear Energy Americas LLC, Model 1500, Certificate of Compliance (COC) USA/5939/B( )F (JL Shepherd & Associates is currently a registered user of this package) if Energy Solutions and General Electric are granted exemptions for these packages.

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Description of Special Permit Proposal, continued.

(2) Specification of the proposed mode of transport.

The mode of transportation will be motor freight for all shipments, using sole use  
transport vehicles, in accordance with increased controls and additional security  
measure orders.

Transport by exclusive use, as suggested in RIS 2008-18.

- a) The transport indexes, the external surface readings, the radionuclides and Curie contents for the shipments in Tables 1, 2 and 3 will be significantly below the exclusive use criteria for shipments (200 mrem/hr not to exceed 1000 mRem/hr at the surface of the package, per 49CFR173.441), based upon comparison of similar type shipments. Historically, similar type shipments have not exceeded a Transport Index of 10 and JL Shepherd & Associates does not expect the shipments in Tables 1, 2, and 3 to exceed this level. All shipments are below Highway Route Control Quantity; the one exception is the delivery of new Cobalt-60 source inventory from the supplier to JL Shepherd & Associates. JL Shepherd & Associates will commit to shipping the Specification 20WC packages, and the COC packages contained in Tables, 1, 2 and 3 using an "exclusive use", "sole use" or "full load" (as defined in 49CFR173.403) mode of motor transport. The "sole use" terminology will be used to differentiate between the two types of "exclusive use" shipments. The shipments include the use of either closed transport or flat bed style transport vehicle. The package is secured within or on the sole use transport vehicle so that its position remains fixed during transportation. There will be no loading or unloading operations performed between the beginning and end of the transportation using sole use vehicles, and work will be performed under the direction of the shipper or receiver. Radiologically trained personnel will perform loading and unloading operations. Resources for safe handling of the shipment will be provided. Specific written instructions, in addition to the shipping papers, are provided to the carrier that provide for actions to avoid unnecessary delays or unnecessarily result in increased radiation levels or radiation exposures to transport workers or members of the general public. These written instructions also contain the instructions required for Radioactive Materials Quantity of Concern shipments, with

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(2) Specification of the proposed mode of transport, continued.

additional security measures, which cannot be discussed in this application.

The shipment of empty packages, specifically empty Specification 20WC packages, will be exempt from this sole use transportation vehicle requirement. The JL Shepherd & Associates' Specification 20WC packages contain no residual radioactivity. They have been only used to transport sealed sources, the vast majority of which meet "Special Form" criteria, either to clients or for return to JL Shepherd & Associates. The Specification 7A or 2R inner packages (approved contents) which contain the sealed sources are free of contamination by a contractual process.

b) Transport during time of low road usage, as suggested in RIS 2008-18.

Transport schedules are dependent upon the amount of time it takes to prepare, load and secure the shipment on the transport vehicle. Best efforts will be made to start a shipment in off rush hour traffic at the various locations.

During transit for sole use vehicles carrying Radioactive Materials Quantity of Concern shipments, there are travel restrictions which cannot be discussed in this application.

c) Accompaniment by escort equipped to affect a recovery in an emergency situation or in case of a transportation accident, as suggested in RIS 2008-18.

A hazardous materials recovery escort for the sole use transport vehicle may not be possible to implement. A private escort would not have the first responder credentials for each state through which the shipment passes, nor would have the local law enforcement and emergency responder support. For Radioactive Materials Quantities of Concern, there is a notification process in place, which cannot be discussed in this application. Per NRC Order EA-08-212, which has appeared on the public docket in a redacted version, but has to date not been received by JL Shepherd & Associates, all quantities of the proposed radioactive material shipments to be covered by the Special Permit would be subject to this notification process.

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(2) Specification of the proposed mode of transport, continued.

The state agencies have the discretion and option as part of this process to provide escorts for shipments. At present there is a higher threshold for Radioactive Materials Quantities of Concern. In the interim, JL Shepherd & Associates will use this process for all the proposed shipments. JL Shepherd & Associates would like to note that in over 40 years of transport there has been no injury or death attributable to radiological causes due to a transportation accident, per NRC's TIP:30, involving the use of Specification 20WC packages and that the JL Shepherd & Associates fleet of Specification 20WC packages have been scrupulously maintained in accordance with a 10CFR71 Subpart H Quality Assurance Program.

(3) Detailed description of the proposed Special Permit.

Package Information:

- a) JL Shepherd & Associates current fleet of fourteen (14) U.S. Department of Transportation (DOT) Specification 20WC packages, maintained in accordance with JL Shepherd & Associates 10CFR71 Quality Assurance Program Plan, Approval 0122, Rev. 9, dated 12/22/2006.

These DOT Specification 20WC packages subject to annual inspections are maintained and repaired under this Quality Assurance Program.

Additionally, these packages have been the subject of inspection of the U.S. Nuclear Regulatory Commission's (NRC) Audits from 2001 to 2006 and a DOT inspection conducted in November 2001. The inspection results were favorable, in respect to the condition and maintenance of the packages.

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The applicable Specification 20WC packages are listed as follows:

20WC3, Serial Number: 22256  
20WC3, Serial Number: 22259  
20WC5, Serial Number: 22196  
20WC5, Serial Number: 22232  
20WC5, Serial Number: 22238  
20WC5, Serial Number: 22240  
20WC5, Serial Number: 22481  
20WC6, Serial Number: 22027  
20WC6, Serial Number: 22080  
20WC6, Serial Number: 22160  
20WC6, Serial Number: 22280  
20WC6, Serial Number: 22281  
20WC6, Serial Number: 22422  
20WC6, Serial Number: 22423

Rented transportation packages:

Energy Solutions Model 10-142, Certificate of Compliance (COC) USA/9208/B  
( ), Serial Numbers to be determined at time of rental and General Electric –  
Hitachi Nuclear Energy Americas LLC, Model 1500, Certificate of Compliance  
(COC) USA/5939/B( )F. Serial Numbers to be determined at time of rental.  
JL Shepherd & Associates is a registered user of these packages.

Identification of shipments:

a) Number of shipments.

A minimum of twenty-five (25) sets of shipments using DOT Specification 20WC  
packages, per the list above, for confirmed orders through the 1st Quarter 2009.  
Omitted from this application, but included with the NRC response, is Table 1,  
which is marked both "Sensitive Information - Not For Public Disclosure" and  
"Security-Related Information - Withhold Under 10CFR2.390".

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A minimum of sixty (60) sets of shipments using DOT Specification 20WC packages, per the list above, for orders currently pending or in negotiation through the 1st Quarter 2010. Omitted from this application, but included with the NRC response, is Table 2, which is marked both "Sensitive Information - Not For Public Disclosure" and "Security-Related Information - Withhold Under 10CFR2.390".

A minimum of seven (7) sets of shipments using either the DOT specification 20WC packages, per the list above or the COC USA/9208/B( ), Model 10-142, a minimum of four (4) shipments solely using COC USA/9208/B( ), Model 10-142 for orders currently pending or in negotiation through the 1st Quarter 2010, or for as long as Energy Solution's extensions are granted.

Projected multiple shipments from General Electric Vallecitos Nuclear Plant to JL Shepherd and Associates or clients, using the COC USA/5939/B( )F Model 1500, for as long as General Electric's extension is granted, for orders currently pending or in negotiation through the 1<sup>st</sup> Quarter 2010.

Omitted from this application, but included with the NRC response, is Table 3, which is marked both "Sensitive Information - Not For Public Disclosure" and "Security-Related Information - Withhold Under 10CFR2.390".

The Tables have been redacted from this application because 49CFR105.30 is only applicable for confidential treatment and security-related information. As this may be a joint NRC/DOT review, the security-related information detailed in the Tables could be made available to the DOT by the NRC.

Note: In the interest of a more expeditious time schedule, it is possible that empty packages may be shipped from one client to another client without return to JL Shepherd & Associates, if the off-site package inspection determines that the package is undamaged.

Packaging serial numbers per shipment are not listed. The serial numbers for the JL Shepherd & Associates Specification 20WC packages are contained in this application. Since the 20WC5's and 20WC6's can be used interchangeably for

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(3) Detailed description of the proposed Special Permit, continued

multiple shipment uses, dependent upon the physical size of the inner package and the maximum gross weight permitted, to assign specific serial numbers to a shipment could cause shipment delays, if a specific package is damaged, quarantined for repairs, or specifically assigned to simultaneous shipments. The serial numbers for the rented transportation packages will be determined at time of rental.

The package contents are sealed sources, the majority meeting "Special Form" criteria, with wattages meeting the package specifications.

The end use of the radioactive material is two fold. These are obsolete material recovery projects for the U.S. Department of Energy, Off-Site Source Recovery Program, U.S. Department of Defense, US Department of Agriculture, NASA, Veterans Administration various state agencies, nuclear utilities, universities, hospitals, biotech firms, drug companies, aerospace companies, and private firms. There is also the delivery of new, replacement or upgraded biological research irradiators, blood irradiators, sterilization irradiators, aerospace testing irradiators dosimeter irradiators and instrument calibrators

Shipment origin and destination by licensee is not included as this information is "Sensitive Information - Not For Public Disclosure" and "Security-Related Information - Withhold Under 10CFR2.390"

Proposed duration.

The general time frame for completion of a minimum of twenty-five (25) sets of shipments using the DOT Specification 20WC packages, per the list above, for confirmed orders is through the 1st Quarter 2009.

The general time frame for completion of a minimum of sixty (60) sets of shipments using the DOT Specification 20WC packages, per the list above, for orders currently pending or in negotiation is through the 1st Quarter 2010.

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The general time frame for completion of a minimum of sixty (60) sets of shipments using the DOT Specification 20WC packages, per the list above, for orders currently pending or in negotiation is through the 1st Quarter 2010.

The general time frame for completion of a minimum of seven (7) sets of shipments using either the DOT specification 20WC packages, per the list above or the COC USA/9208/B( ), Model 10-142, and a minimum of four (4) shipments solely using COC USA/9208/B( ), Model 10-142 for orders currently pending or in negotiation through the 1st Quarter 2010, or for as long as Energy Solution's extensions are granted.

Projected multiple shipments from General Electric Vallecitos Nuclear Plant to JL Shepherd and Associates or clients, using the COC USA/5939/B( )F Model 1500, for as long as General Electric's extension is granted, for orders currently pending or in negotiation through the 1<sup>st</sup> Quarter 2010.

This schedule is expected to allow sufficient time for NRC review and approval of the new JL Shepherd & Associates Certificate of Compliance package application and to have new packages built after the approval. JL Shepherd & Associates reserves the right to make additions to the numbers of shipments and time frames as the new package program approval time frame develops.

The last date the shipment will be completed is dependent upon the new package approval and new package build time, dependent upon the success of the destructive prototype testing. The engineering analysis of the new JL Shepherd & Associates Certificate of Compliance package has determined a safety factor of 1.5 (71.73), and we have every confidence that the prototype will pass the destructive testing program.

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Reasons for Requesting Extended Use.

Why acquiring replacement packages is not practical.

Per a RAMPAC (Radioactive Materials Packages) website search and contact with Energy Solutions and other Type B(U) package owners, the domestically approved packages available for shipment after 10/1/2008, for the type and quantity of radioactive material identified in (2) above, are:

Certificate of Compliance USA/9168/B, Model 8-120B

and Certificate of Compliance USA/9402/B ( )-85, Model 10-160B

- i) These packages must travel the highways on over wide, over weight tractor-trailers, which have many travel hour and route restrictions, with layovers to accommodate travel restrictions, which highly increases the risk profile to the public and for security measures.
- ii) These packages must be opened with a crane, for which the space required, may require street closures for the movement of the material from the facility to the truck staging location, creating a much higher risk profile to the public and for security measures.
- iii) Dependent upon the previous use of these packages, the residual contamination from by product or source material in the form of solids, dewatered resins or process solids or solidified waste in secondary containers, including fissile material, may require the receiving licensee to amend their licensees for temporary possession of radionuclides not normally associated with their licenses, which will delay the shipment scheduling.
- iv) JL Shepherd & Associates recommends air sampling when opening these packages, due to the potential release of non-fixed internal contamination at both the delivery and receiving sites.
- v) Contamination control measures need to be implemented for the possibility of external contamination to the devices and the sealed sources from the COC packages.

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- vi) Due to the wattage restriction of these packages, multiple packages may need to be used for a single shipment, creating a much higher risk profile to the public and for security measures. For example, if three (3) or four (4) Specification 20WC packages are to be used for a single shipment, these packages can travel on the same single transport vehicle rather than on three (3) or four (4) over wide and over weight transport vehicles, reducing the transport risk.

Why shipments cannot be made before the October 1, 2008 expiration date.

All attempts will be made to make as many shipments as possible by October 1, 2008 by JL Shepherd & Associates. In the interest of a more expeditious time schedule, it is possible that empty packages may be shipped from one client to another client without return to JL Shepherd & Associates, if the off-site package inspection determines that the package is undamaged.

Delays have occurred and will occur due to:

- i) Weather conditions not conducive to safe transport: i.e. currently hurricanes, tropical storms, tornado watches, fires, flooding, and other natural weather events.
- ii) Shipment restrictions due to the Republican and Democratic Presidential Conventions and other high risk events as determined by the USNRC.
- iii) Receiving licensees not yet meeting Increased Control requirements for security to receive the shipments.
- iv) Receiving licensees' building construction projects not completed, and no viable on-site storage meeting Increased Controls requirements
- v.) Receiving licensee's licenses not yet finalized,

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- v.) Receiving licensee's licenses not yet finalized,
- vi) Receiving licensee has not finished characterizing replacement calibration ranges, so obsolete material is still in use.
- vii) Unscheduled and unanticipated delays by sealed source vendors for delivery of new sources required for the devices to be delivered by JL Shepherd and Associates.
- viii) The numbers of the current JL Shepherd & Associates' 20WC fleet of packages is insufficient to make all shipments by October 1, 2008, combined with the regulatory prohibition to manufacture new 20WC packages since January 2004, per NRC and DOT rulemaking.
- ix) The systemic and endemic Nuclear Industry problem of the "graying" or retirement and attrition of professionals capable of the support systems required for the preparation and use of these packages.
- x) Implementation of NRC's Order EA-08-212.
- xi) Increases to the Department of Homeland Security threat level, as now undetermined and dependent upon intelligence of a credible threat.
- xii) Licenses of clients to receive the shipments per Tables 1, 2 and 3 typically do not include the residual isotopes contained in the rental packages available, per 3) above, and temporary licenses may need to be issued before receipt, dependent upon contamination levels.
- xiii) Staff, including those personnel involved with the shipments, per Tables 1, 2 and 3, working with various Federal agencies on additional security measures for radionuclides of concern.

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Contents cannot be reconfigured such that transport can be conducted in  
accordance with the regulations.

A single special form or sealed source contained in the proposed shipments are above a Type A<sub>1</sub> quantity of radioactive materials and cannot be reconfigured to meet the criteria of 54.1 Curies per source for Cesium-137 or 10.8 Curies per source for Cobalt-60, without destruction of the source capsule for re-encapsulation of the radionuclides, which results in extreme risk of major contamination to the public and all licensees involved. We are not aware of any license, including JL Shepherd & Associates, that permits deliberate on-site destruction of a viable source for re-encapsulation of the material into smaller sources for shipment. This work requires a licensed hot cell facility. In our opinion, bringing a portable hot cell facility to a licensee's facility, if it is possible, increases the risk to the general public and significantly raises the security profile of the activity. We also doubt that any current non-nuclear power licensee is eligible for the Price Anderson nuclear pollution insurance coverage to cover the generation of the amount of contamination associated with this destruction and re-encapsulation process.

The transport schedule cannot be adjusted so as to be conducted in accordance with  
the regulations.

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Good faith efforts to acquire replacement packages that meet current package performance requirements and status.

JL Shepherd & Associates is actively engaged in the process of developing a replacement package for the shipment of sealed sources. This process formally started in June 2005, with the initial selection of an engineering team.

JL Shepherd & Associates met with the NRC on August 2, 2006 to discuss concepts for the new JL Shepherd & Associates Certificate of Compliance package for the shipment of sealed sources.

From the time of the concept approval to final prototype design, including finding and approving a 10CFR71 approved vendor for prototype package manufacture took twenty-two (22) months.

A purchase order was let in September 2007 for the prototype package; however audit response and audit corrective actions from the 10CFR71 licensed package manufacturer and final design adjustments delayed completion of the prototype packages until July 2008.

Destructive prototype testing of the prototype package is due to start on September 5, 2008.

Certificate of Compliance submittal to the NRC, based upon testing results and modeling for anticipated requests for ensuing information as part of the package submittal is estimated to be made in the relatively near future.

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Adverse impacts that will result if the shipment is not conducted.

For decommissioning of obsolete materials, the adverse impact would be that the material would need to remain on-site at the licensees' location for an unknown time duration, subjecting the obsolete material, the licensee and the general public to additional risk.

For the delivery of new sources/devices, the majority of these shipments involve either direct or indirect tax dollars, or federal appropriations, funding for which may not be subject to delays of an unknown duration.

For deliveries of new sources/devices, especially in the biomedical and medical research areas and in the aerospace areas, the economic impact cannot be calculated, including the loss to the gross national product for delays of unknown duration.

Safety Justification for Continued Use and Proposed Compensatory Measures.

Special package inspections, tests or demonstrations that ensure that the packaging is in unimpaired physical condition.

The JL Shepherd & Associates fleet of DOT Specification 20WC packages are subject to annual inspections, are inspected prior to every shipment and are maintained and repaired under the JL Shepherd & Associates 10CFR71 Subpart H Quality Assurance Program. Additional inspections are not required, as these packages currently are in an unimpaired physical condition.

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Additional testing or demonstrations will not be required.

The DOT Specification 20WC packages were subjected to many of the current test requirements by Sandia National Laboratories, as documented in the Sandia Report SC-RP-65-98, pages 141-156. Copies of this Report available upon request. The Atomic Energy Commission requested that Sandia Corporation help in the development of containers for shipping radioactive materials that would withstand the testing listed below and to assist in the subsequent formulation of appropriate regulations. This testing program was the development of the current DOT specification 20WC packages.

Testing parameters included:

- a thirty foot (30') free fall to an unyielding surface. Tests included one (1) four thousand (4000) pound container being dropped three (3) times, once at 45°, once on a side and once on an end. There were a total of ten (10) drop tests performed on eight (8) prototypes. The 20WC prototype survived the drop tests in a suitable condition for the fire test to be performed.
- A forty inch (40") drop onto a six inch (6") diameter by eight inch (8") long carbon steel spike, with the container positioned to cause maximum damage in both drops. This test was not performed in the report test sequence. Sandia did note that "meeting this requirement is not considered to be a problem).
- An ASTM standard one (1) hour fire. An open pit petroleum fire, using JP-4 jet fuel, a more extreme test than that required by the ASTM standard curve. The fire tests confirmed earlier conclusions that "the superior performance of fir plywood laminated shells in protecting an inner ICC-55 or similar container from the rigors of a sever accident."

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- A twenty-four (24) hour submersion of the container in water to a depth of three feet (3') over the uppermost portion of the container without leakage of the contents or the loss of any shielding. As of the time this report was generated, "The water submersion criterion has, with the exception of one test, been largely ignored, because the development concept of this shipping container was an outer shell protecting an inner container from essentially all effects of shock and fire. If this is done, a water-tight seal on the inner container is a simple matter to maintain."

While Sandia did not specifically address the forty inch (40") drop onto a spike or peg and specifically did not address the water test, except to require a water tight seal on the inner container, the NRC's January 1999 TIP:30 Transport of Radioactive Materials states that "The excellent safety record developed over more than 30 years during which millions of radioactive materials shipments have been made without identifiable injury or death attributable to radiological causes. In addressing the adequacy of safety standards "In 1981, the NRC reevaluated its regulations concerning transportation of radioactive materials and concluded no immediate changes were needed to improve safety (Ref.NUREG-0170)." This assessment was based upon a package design to withstand "a series of impact, puncture and fire environs, thereby providing a reasonable assurance that packages will withstand serious transportation accidents. The DOT Specification 20WC's were a part of the currently approved transport containers at that time. In the nine years since the TIP:30 was written, there has been no identifiable injury or death attributable to radiological causes due to a transportation accident involving the use of Specification 20WC packages.

The Sandia Report was used for the development of the regulations governing the DOT Specification 20WC packages. In regard to the immersion test, the inner packages for the Specification 20WC package evolved into the Type A or Specification 7A package concept,

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which includes a water test as part of that package testing protocol, per 49CFR173.465. The Specification 7A packages in Tables 1, 2 and 3 do not contain liquids or gasses. The Specification 7A package contains a "Special Form" capsule which is also subjected to leak tightness testing, per 49CFR173.469. The Specification 7A packages used by JL Shepherd & Associates are typically a steel shell or mold containing lead (or lead equivalent) biological shielding and a Special Form source. This combination of inner packaging is impervious to water. The other approved inner package is a Specification 2R inside containment vessel, which must "be made of stainless steel, malleable iron, or brass or other material having the equivalent physical strength or fire resistance" per 49CFR178.360

Plan and Schedule to Acquire Replacement Packages or Complete Necessary Shipments.

Please see above for status on JL Shepherd & Associates replacement package schedule for the shipment of sealed sources.

(4) JL Shepherd & Associates is seeking emergency processing as specified in 107.117.

Emergency processing is being asked for because:

The obsolete material recovery projects for the U.S. Department of Energy, Off-Site Source Recovery Program, U.S. Department of Defense, US Department of Agriculture, NASA, Veterans Administration various state agencies, nuclear utilities, universities, hospitals, biotech firms, drug companies, aerospace companies, and private firms is vital for national security purposes for the removal of unwanted or unsecured radioactive materials.

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(4) JL Shepherd & Associates is seeking emergency processing as specified in 107.117.

The delivery of new, replacement or upgraded biological research irradiators, blood irradiators, sterilization irradiators, aerospace testing irradiators dosimeter irradiators and instrument calibrators is equally vital for national security interests, especially those projects funded by the National Institutes of Health or the Center for Disease Control and those directly funded by tax dollars by appropriations to state and federal agencies.

Copies of all reports referenced in this request for extension are available upon request.

JL Shepherd and Associates welcomes this opportunity to enter into a dialog with both the NRC and the DOT on the extension for limited use for expiring transportation packages.

  
\_\_\_\_\_  
J.L. Shepherd, President

  
\_\_\_\_\_  
William H. Brown, Quality Assurance Manager

Cc: Donald R. Neely, General Manager, JL Shepherd & Associates  
Mary F. Shepherd, Vice President, JL Shepherd & Associates  
Diana C. Shepherd, Vice President, JL Shepherd & Associates