



U.S. Department
of Transportation

East Building, PHH-23
1200 New Jersey Ave., SE
Washington, D.C. 20590

Pipeline and
Hazardous Materials
Safety Administration

COMPETENT AUTHORITY CERTIFICATION
FOR A TYPE B(U)F FISSILE
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/0808/B(U)F-96, REVISION 0

REVALIDATION OF GERMAN COMPETENT AUTHORITY CERTIFICATE
D/4214/B(U)F-96

This certifies that the radioactive material package design described below is hereby approved for use within the United States for import and export shipments only. Shipments must be made in accordance with the applicable regulations of the International Atomic Energy Agency¹ and the United States of America².

1. Package Identification - CASTOR THTR/AVR.
2. Package Description and Authorized Radioactive Contents - as described in German Certificate of Competent Authority D/4214/B(U)F-96, Revision 11 (attached). Authorized radioactive contents are only as listed on Sheet 4, item "3", of the German certificate.
3. Criticality - The minimum criticality safety index is 0.0. The maximum number of packages per conveyance is determined in accordance with Table X of the IAEA regulations cited in this certificate.
4. General Conditions -
 - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.
 - b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.
 - c. This certificate does not relieve any consignor or

¹ "Regulations for the Safe Transport of Radioactive Materials, 2012 Edition, No. SSR-6", published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

² Title 49, Code of Federal Regulations, Parts 100 - 199, United States of America.

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carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

- d. Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations¹ shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.

5. Special Conditions -

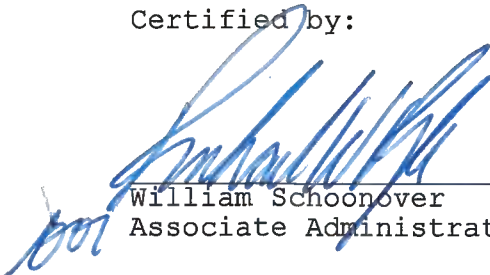
- a. Packages must be transported as exclusive use.
- b. The pre-shipment leakage test at 10^{-7} ref cm^3/sec (air) must include the cask body as well as the seal regions.

6. Marking and Labeling - The package shall bear the marking USA/0808/B(U)F-96 in addition to other required markings and labeling.

7. Expiration Date - This certificate expires on January 24, 2027.

This certificate is issued in accordance with paragraph 816 of the IAEA Regulations and Section 173.473 of Title 49 of the Code of Federal Regulations, in response to the February 18, 2015 petition by Department of Energy, Washington, DC, and in consideration of other information on file in this Office.

Certified by:



William Schoonover
Associate Administrator for Hazardous Materials Safety

FEB 17 2017

(DATE)

Revision 0 - Issued to revalidate, for limited contents and with the stated special conditions, German Certificate of Approval No. D/4214/B(U)F-96, Revision 11.

Bundesamt für kerntechnische Entsorgungssicherheit (Federal Office for the Safety of Nuclear Waste Management)



Certificate of Approval

D/4214/B(U)F-96 (Rev. 11)

for a Type B(U) package design for fissile radioactive materials

Based on the application by the company GNS Gesellschaft für Nuklear-Service mbH, Essen, dated March 22nd 2016 (Ref no.: V059-011-FKa) in connection with the letter dated January 23rd 2017 (Ref no.: V059-052-AR) the cask with the manufacturer's designation **Transport and Storage Cask CASTOR® THTR/AVR** is approved to be a type B(U) package design for fissile radioactive material according to the following regulations regarding the transport by road, railway, sea and inland waterways:

Regulations for the Safe Transport of Radioactive Material, 2012 Edition, International Atomic Energy Agency (IAEA), No. SSR-6,

European Agreement of September 30th 1957 concerning the International Carriage of Dangerous Goods by Road (ADR) (Federal Gazette (BGBl.) 1969 II p. 1489), Annex A and B as amended and published April 17th 2015 (Federal Gazette (BGBl.) 2015 II p. 504, 2016 II p. 50), last amended by the 25th ADR amendment of October 25th 2016 (Federal Gazette (BGBl.) 2016 II p. 1203),

Regulation concerning the International Carriage of Dangerous Goods by Rail (RID) - Attachment C of the Convention concerning International Carriage by Rail service of May 9th 1980 (COTIF convention) (BGBl. 1985 II p. 130), as amended and published May 16th 2008 (Federal Gazette (BGBl.) 2008 II p. 475, 899; 2009 II p. 1188, 1189; 2010 II p. 1273; 2012 II p.168, 169, 1338; 2013 II p. 562, 2014 II p. 890, 2015 II p. 1143, 1144), most recently amended by the 20th RIO amendment of November 11th 2016 (Federal Gazette (BGBl.) 2016 II p. 1258),

International Maritime Dangerous Goods Code (IMDG-Code), Amendment 37-14, in the official German translation of November 13th 2014 (Transport Gazette (VkB). 2014 p. 810)

European Agreement of May 26th 2000 regarding the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (Federal Gazette (BGBl.) 2007 II p. 1906, 1908, 2009 II p. 534; 2010 II p. 122, 123, 1183, 1184, 1534, 1550, 1551, 1569, 1570; 2012 II p. 1386, 2014 II S. 1344, 2015 II S. 1033, 2016 II S. 1219, 1220), most recently amended by the 6th ADN Amendment Regulation of November 25th 2016 (Federal Gazette (BGBl.) 2016 II p. 1298),

Ordinance on the national and international carriage of dangerous goods by road, rail, and inland waterways GGVSEB (Gefahrgutverordnung Straße, Eisenbahn und Binnenschifffahrt) in the version of the announcement of March 30th 2015 (BGBl (Federal Gazette) 2015 I p. 366) most recently amended by Article 6 of the Act of July 26th 2016 (Federal Gazette (BGBl.) 2016 I p. 1843),

Ordinance concerning the Transport of Dangerous Goods by Sea (Carriage of Dangerous Goods Ordinance Sea - GGVSee) of February 9th 2016 (Federal Gazette BGBl. I p. 182), most recently amended by Article 14 of the Act of July 26th 2016 (Federal Gazette (BGBl.) 2016 I p. 1843),

in conjunction with the Guideline for the design approval procedure of packages for the transport of radioactive material, of special form radioactive material and low dispersible radioactive material (R003) in the version published on June 9th, 2016 (Transport Gazette (VkBl) 2016 p. 430) and the BAM (Federal Institute for Materials Research and Testing)Rule for Dangerous Goods on Quality Assurance Measures of Packagings for Competent Authority-approved Package Designs for the Transport of Radioactive Material (BAM-GGR 011) Rev. 0 dated June 25th, 2010 (Amts- und Mitteilungsblatt (Official Bulletin and Gazette) of the BAM 2011 p. 323), enacted by official publication dated July 1st, 2010 (Transport Gazette (VkBl.) 2010 p. 282)

It is hereby confirmed that the Federal Office for the Safety of Nuclear Waste Management is the authority authorised by the Federal Ministry of Transport and Digital Infrastructure in accordance with Chapter 7.9 of the IMDG code.

Approval holder: GNS Gesellschaft für Nuklear-Service mbH
Frohnhauser Straße 67
45127 Essen

Documents:

Application documentation for the package design approval procedure of the type B(U)F package **Transport and Storage Cask CASTOR[®] THTR/AVR**
- safety analysis report –

according to the registers

Part I - Design -
Report GNB B 135/2004, Rev. 9

Part II - Construction -
Report GNB B 063/2004, Rev. 4

Part III - Operation -
Report GNB B 136/2004, Rev. 7

"Complement to the Criticality Safety Report Type B(U)F Package Transport and Storage Cask CASTOR[®] THTR/AVR", Technical Note E 2006/0168, Rev. 0

"Evaluation of the amendments of the 17th to 24th European Agreement concerning the International Carriage of Dangerous Goods by Road Amendment Decrees with regard to their relevance to the safety analysis report upon which the approval is based",
Technical Note E 2007/0018, Rev. 4

Evaluation report of design CASTOR[®] THTR/AVR, Methods of analysis and service experience,
Report GNB B 089/2011, Rev. 5

Evaluation report of design CASTOR[®] THTR/AVR, Ageing influences,
Report GNS B 128/2013, Rev. 5

*With regard to the analysis of the criticality safety particular attention is drawn to the report:
GNB B 332/2003, Rev. 0 (Document UI-11) and Technical Note E 2006/0168, Rev. 0*

Manufacturer's designation: **Transport and Storage Cask CASTOR[®] THTR/AVR**

Identification mark: **D/4214/B(U)F-96**

Expiry date: **until** January 24th 2027 inclusively
(taking into account No. 9 of the conditions and obligations)

Authorized Radioactive Contents

Radioactive material from the thorium high temperature reactor THTR-300 and the high temperature reactor of the Arbeitsgemeinschaft Versuchsreaktor GmbH (AVR).

The following load variations are allowable:

1. Radiated (undamaged and damaged) fuel elements from the thorium high temperature reactor (THTR-FE) in a THTR canister (steel canister, debris canister, waste canister). Instead of the THTR-FE, the THTR canister may also contain (undamaged and damaged) operating elements (BTE - "Betriebs Elemente") free from fissile material. For each package the total heat capacity is max. 217 W and the total activity max. 1.5 PBq.

THTR-FE are spherical FE (diameter 60 mm) consisting of a centrally located graphite matrix (diameter 50 mm), which contains the fuel in the form of coated particles, and an external graphite shell (thickness 5 mm). The coated particles consist of a fuel core made up of oxidic uranium and/or thorium compounds and surrounding coatings of the fuel core for retaining the fission products. The coatings consist of a porous buffer coat surrounded by two coats made up of pyrolytic carbon (BISO). The THTR-FE featured an original degree of enrichment with U-235 of 93 % maximum (mass of U-235 before radiation 0.96 g for each FE) and has a mass of approx. 203 g per FE.

The BTE (operating elements) are absorber and graphite elements free from fission materials (diameter 60 mm, respectively), with hafnium and boron having been added as neutron absorbers to the absorber elements of the graphite in the ball centre (up to 50 mm diameter). The mass of these elements is approximately 190 g per BTE.

1.a) Load variation "steel canister"

max. 2110 THTR FE with a maximum burn-up of 114 GWd/tHM and a minimum cooling time of 15 years in a steel canister.

1.b) Load variation "debris canister"

max. 2320 THTR FE with a maximum burn-up of 114 GWd/tHM and a minimum cooling time of 15 years in a debris canister.

1.c) Load variation "waste canister"

max. 210 THTR FE with a maximum burn-up of 70 GWd/tHM and a minimum cooling time of 15 years, together with approx. 0.5 kg eroding material and approx. 9 kg molecular sieve (metal aluminium silicate) as well as approx. 2 dm³ re-combination catalytic converter (Al₂O₃ with 5 % by wt. Pd) in 2 carrier housings, in a waste canister.

2. Burn-up measuring reactor fuel assemblies (AMR-FE) with a total of max. 2.58 kg Uranium (original degree of enrichment with U-235 93 % max., mass of U-235 before irradiation 2.4 kg per package), a maximum burn-up of 0.13 GWd/ tHM and a minimum cooling time of 15 years in two burn-up measuring reactors fuel assembly storage frame casks (ABL), located one above the other in the package. For each package the total heat capacity is max. 0.7 W and the total activity max. 1.5 PBq.

AMR-FE consist of homogeneous, uncoated rectangular plates (width 15 mm, length 89 mm to 711 mm, strength 1.1 mm), which are made up of an aluminium alloy with a concentration of 80 % aluminium and a concentration 20 % Uranium.

3. A maximum of 1900 radiated (undamaged) fuel elements from the high temperature reactor of the Arbeitsgemeinschaft Versuchsreaktor GmbH (AVR) with an original degree of U-235 enrichment of either maximum 17 % (mass of U-235 before irradiation 1.4 g per FE) or maximally 93 % (mass of U-235 before irradiation 1 g per FE), a maximum burn-up of 194 GWd/tHM and a minimum cooling time of 15 years in two AVR-TL canisters, that are located one above the other in the package, with a single canister containing up to 960 AVR-FE. Instead of the THTR-FE, the AVR-TL canister may also contain (undamaged) operating elements (BTE - "Betriebsselemente") free from fissile material. For each package the total heat capacity is max. 141 W and the total activity max. 1.5 PBq.

AVR-FE are spherical FE (diameter 60 mm) consisting of a centrally located graphite matrix (diameter 50 mm), which contains the fuel in the form of coated particles, and an external graphite shell (thickness 5 mm). The coated particles consist of a fuel core made up of carbide or oxidic uranium and/or thorium compounds and surrounding coatings of the fuel core for retaining the fission products. The coatings consist of a porous buffer coat surrounded by either two coats made up of pyrolytic carbon (BISO) or two coats made up of pyrolytic carbon with an inserted silicon carbide coat (TRISO). The AVR-FE have a mass of approx. 214 g per FE.

The BTE (operating elements) are absorber and graphite elements free from fission materials (diameter 60 mm, respectively), with hafnium and boron having been added as neutron absorbers to the absorber elements of the graphite in the ball centre (up to 50 mm diameter). The mass of these elements is approximately 206 g per BTE.

Criticality Safety Index (CSI): 0

Packaging Design:

The design of the Transport and Storage Cask CASTOR[®] THTR/AVR fulfils with regard to the mechanical and thermal characteristics confirmed with the Examination Certificate of the Federal Institute for Materials Research and Testing (BAM) of October 31st 2006 (Ref no.: III.3/20978) and Expert Report of BAM January 12th 2017 (Ref no.: 16014862) in conjunction with the letter of BAM January 23rd 2017 (Ref no.: 3.3/16014862/2017/04/Gr) and with regard to the criticality safety and the radiation shielding after having examined by the BfE the requirements on a Type B(U) package design for fissile radioactive materials (IAEA Regulations for the Safe Transport of Radioactive Material, 2005 Edition, §§ 650 to 664 and 671 to 682).

For the criticality analysis leakage of water into all void spaces of the packaging has been assumed.

Description of the Packaging:

The Transport and Storage Cask CASTOR[®] THTR/AVR consists of a cylindrical basic part made up of spheroidal graphite cast iron (material designation GGG40) and two individually sealed lids located one above the other (primary and secondary lid) and comprises a cylindrical inner chamber for receiving a THTR canister (content 1) or two ABL (content 2) or two AVR-TL-canisters (content 3). Depending on the actual content three different variants of the primary lid may be used:

- Variant A (Item 20 of the parts lists) with the primary lid made up of GGG40 or ST 52-3 or TStE 355 for the contents 1 or 2
- Variant B (Item 19 of the parts lists) with the primary lid made up of ST 52-3 or TStE 355 for the content 3
- Variant C (Item 19 of the parts lists) with bolted-in shielding plate (Item 117 of the parts lists) complete with the lid and the shielding plate made up of ST 52-3 or TStE 355 for the contents 1 or 2

The secondary lid (Item 55 of the parts lists) consists of structural steel (Fe 510 D1 or TStE 355).

Wooden shock absorbers with metal sheet casing are located at the top and bottom sides, connected to one another by means of two support tubes. Here, there is a fixed mechanical connection of the two shock absorber pairs (Item 108 of the parts lists). The protection plate is located between the secondary lid and the shock absorber (Item 81 of the parts lists). In the top and bottom area of the cask sidewall, two bores are respectively fitted into which two long trunnions are screwed in at the top - for handling the cask - and two short trunnions at the bottom for transportation.

On the conveyance, the package is covered by a guard plate that represents the easily accessible surface in the terms of the transport regulations.

The 'leak-tight containment' is set up with the following components or construction elements:

• **"Leak-tight containment primary lid":**

- the cask body,
- the bolted-on primary lid with its metal O-ring seal,
- the bolted-on protective cap in the primary lid with its metal O-ring seal.

or

• **"Leak-tight containment secondary lid":**

- the cask body,
- the bolted-on secondary lid with its metal O-ring seal,
- the bolted on protective cap in the secondary lid with its metal O-ring seal
- the bolted on blind flange with its metal O-ring seal.

For shielding reasons, the complete lid system (primary and secondary lid with associated supplementary closures as well as protection plate) is fitted. However, the sealing function of the respective other lid is not taken into consideration.

Main dimension of cask CASTOR[®] THTR/AVR:

Diameter:	approx. 1380 mm
Maximum width (with shock absorbers):	approx. 2090 mm
Height (without shock absorber) :	approx. 2784 mm
Height (with shock absorbers) :	approx. 3906 mm

Mass of transport configuration: max. 32100 kg
(Cask complete with loading "debris canister", with primary and secondary lid, with protection plate, with bottom and lid shock absorbers)

Packaging designs identified by the respective revision indices of the parts lists listed in Annex 2 currently correspond to this approval certificate (see No. 7 of Conditions and Obligations).

Conditions and Obligations:

1. All quality-assurance measures during planning, manufacture, the accompanying checks and operation must be carried out in accordance with the stipulations of the dangerous goods rule of the BAM (Federal Institute for Materials Research and Testing) "Quality Assurance Measures of Packagings for Competent Authority Approved Package Designs for the Transport of Radioactive Material" (BAM-GGR 011, Rev. 0).
 2. The remanufacturing of packagings is not admissible. Exceptions are made for the re-manufacturing of shock absorbers according to footnote 1 in Appendix 2 having regard to the changes according to No. 7 of the conditions and obligations.
 3. This approval only applies in conjunction with the certificate of inspection before commissioning (acceptance certificate) issued for each individual serial cask which has to be submitted to BAM and BfE without further demand. Deviations tolerated by BAM according to BAM-GGR 011 as well as modifications according to Conditions and Obligations No. 7 have to be documented in this acceptance certificate.
For already manufactured packagings the deviations tolerated by BAM and modifications according to Conditions and Obligations No. 7 have to be documented in the logbook of the packaging.
 4. It has to be ensured that each user of the packaging has been registered by BfE prior to the first use and confirms that he has received the logbook, which includes especially the Certificate of Approval, the Operation Instructions and the Test Plans for Periodic Inspections, and that he will comply with them. Especially to be mentioned are:
 - Operation instructions for Type B(U)F package transport and storage casks CASTOR[®] THTR/AVR to meet transport regulations, GNB B 093/97, Rev. 15
 - "Periodic inspections of approval requiring transport casks or transport and storage casks for radioactive materials"
Test Instruction PV 120, Rev. "i"
 - Plans for periodic inspections on a CASTOR[®] THTR/AVR
WKP-Nr. 500.07-01, Index 8
WKP-Nr. 500.07-02, Index 8
WKP-Nr. 500.07-03, Index 12 and
WKP-Nr. 500.07-04, Index 6
- The use of documents with higher revision indices is only authorized in conjunction with this design approval after prior release by BAM and under approval by BfE.
5. Each packaging has to be marked permanently with the identification mark specified above and the date (month, year) of the next periodic inspection. In case of already accepted packagings, unless already present, the addition "-96" has to be added to the identification mark on the type plate during the next periodic inspection.
 6. Each packaging has to be duly inspected periodically. The certificates confirming the result of every periodic inspection has to be submitted to BAM and BfE without further demand.
 7. Changes of the parts lists as well as of the drawings and material specifications listed therein, which are the basis of the design approval, require after prior release by BAM the authorization by BfE in form of an approval to a Change Notification or to an extended Type List (according to Appendix 2). Thereby, the changes become part of this design approval.
 8. Concerning the necessity of a transport under exclusive use reference is made to the above mentioned regulations regarding the transport by road, railway, sea and inland waterways.

9. Once later issues of the IAEA recommendations SSR-6 than those cited on Sheet 1 of this approval certificate have been implemented into national and international regulations, the approval holder has to evaluate the changes made in the regulations with regard to their relevance for the safety analysis report this approval is based on. This evaluation has to be submitted to the BfE and the BAM at the latest, 6 months after the regulations have come into force.
Five years after this approval has been granted, the approval holder has to evaluate the applicability of the regulations as well as the analysis methods used for safety-related design of the package as described in the safety analysis report and has to submit the evaluation report to BfE and BAM. This report is a precondition for maintaining the period of validity of this approval and becomes a part of this approval after release by BAM and approval by BfE.
10. This approval does not release the consignor from the necessity to comply with any regulations by the government of a country through or into the package is transported.

Costs:

1. Due to § 12 para. 1 and 2 of the Act on the Carriage of Dangerous Goods (Gefahrgutbeförderungsgesetz - GGBefG) in the version of its promulgation of July 7th 2009 (BGBl. 2009 I p. 1774, 3975), last amended by Article 5 of the Act of 26th July 2016 (BGBl. 2016 I p. 1843), in connection with § 1 para. 2 of Cost Ordinance on Measures during the Carriage of Dangerous Goods (GGKostV) of March 7th 2013 (BGBl. 2013 I p. 466), last amended by Article 13 of the Act of July 26th 2016 (BGBl. 2016 I, p. 1843), for this order costs are charged - charges and expenses. The fees are calculated on the basis of § 2 in conjunction with Appendix 2 of the GGKostV.
2. According to Section 12 para. 1 of the GGBefG in conjunction with Section 13 para. 1 no. 1 of the Administrative Expenses Act (VwKostG) dated June 23, 1970 (Federal Gazette (BGBl.) I p. 821), in version of December 5, 2012 (Federal Gazette (BGBl.) I p. 2415), which was valid until August 14th 2013, the costs are to be borne by the firm GNS Gesellschaft für Nuklear-Service mbH Essen.
3. The costs will be fixed in a separate notice.

Information on legal remedies:

An objection against this order can be filed within one month after notification at the Federal Office for the Safety of Nuclear Waste Management in Berlin.

Salzgitter, January 24th 2017

On behalf of

/signature/

Börst

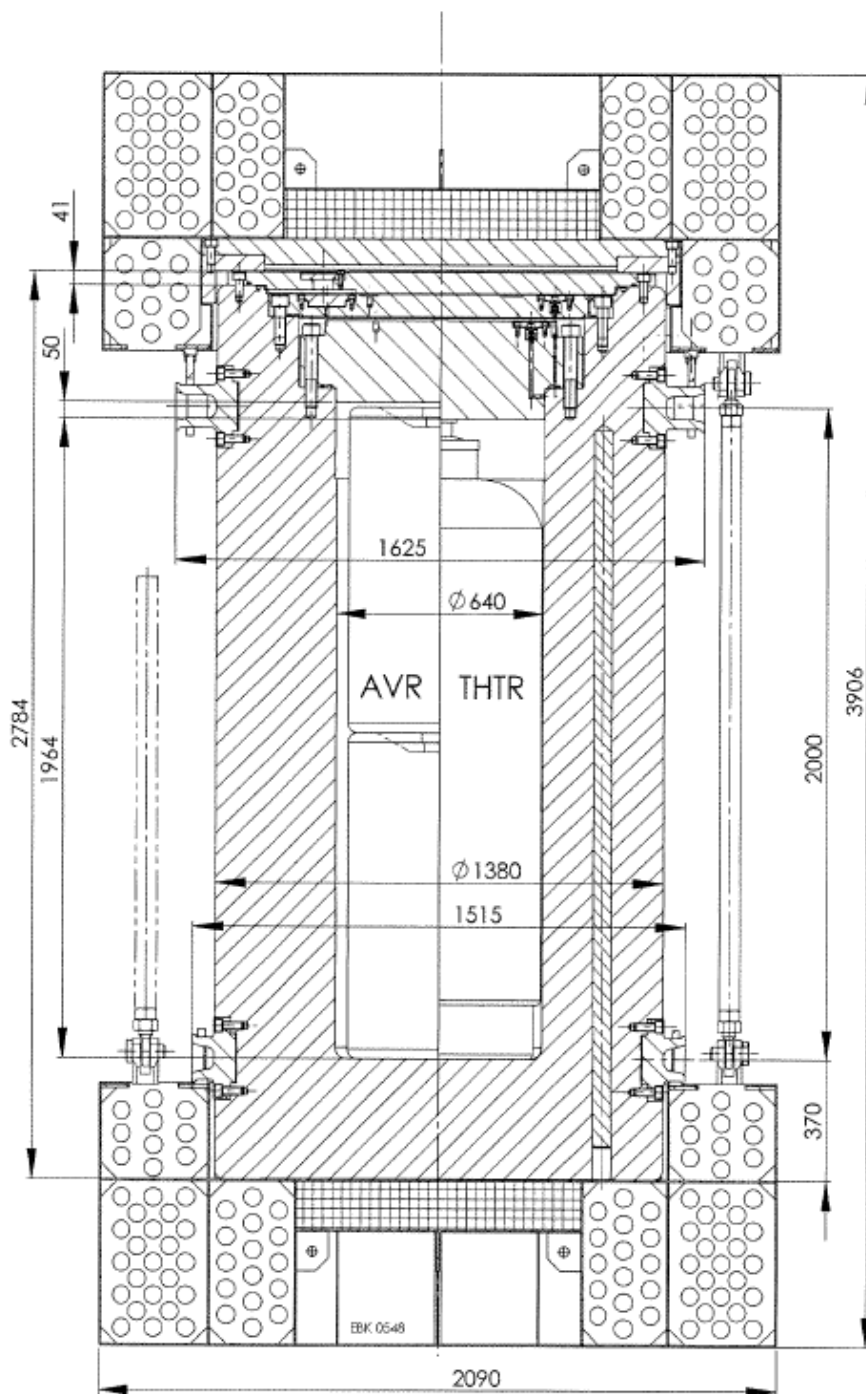
Appendices

Annex

Appendix 1, Fig. 1 and Fig. 2: General drawings

Appendix 2: Type list for Transport and storage cask CASTOR[®] THTR/AVR

Rev.no.	Issue date	Expiry date	Reason for changes
0	July 17 th 1987	July 31 st 1990	First issue
1	August 30 th 1988	August 31 st 1991	completely revised version with an extension of the contents, modification of the cask and changed incidental provisions
2	June 27 th 1989	June 30 th 1992	completely revised version with changed drawings, changed description of the package, changed incidental provisions and new period of validity
3	July 12 th 1991	December 31 st 1992	Extension of the admissible contents, changed drawings, changed incidental provisions, new period of validity, replacement for revision 2
4	December 15 th 1992	December 31 st 1995	Revision with changed traffic regulations on the basis of the IAEA Regulations of 1988, other applicant, changes in the sections: manufacturer, drawings, documentation, cask classification, incidental provision
5	September 13 th 1994	September 30 th 1997	Revision with changes in the sections drawings, documentation, admissible contents, description, incidental provisions and notes, new period of validity; Note: Period of validity of rev. 4 of the approval is simultaneously limited to December 31 st 1994.
6	September 29 th 1997	September 30 th 2000	completely revised version with new period of validity
7	September 28 th 2000	September 28 th 2003	Updating of the regulations; Restructuring of the sections: documentation, admissible contents; Updating of the section on incidental provisions and notes; new period of validity
8	September 25 th 2003	March 31 st 2005	Extension of the period of validity, adaptations due to changed legal provisions (references to regulations, SIC, costs)
9	March 24 th 2005	March 24 th 2008	New manufacture of packages excluded, extension of the period of validity, adaptations due to changes in legal provisions (references to regulations, costs)
10	January 25 th 2007	January 25 th 2017	complete revision on the basis of the IAEA Regulations TS-R-1 of 2005, Note: Replacement for approval certificate D/4214/B(U)F-85 (Rev. 9)
11	January 24 th 2017	January 24 th 2027	Adaptation to changed legal regulations (references to regulation, costs), consideration of revised and new documentation, extension of the period of validity, Updating of the section on incidental provisions and notes



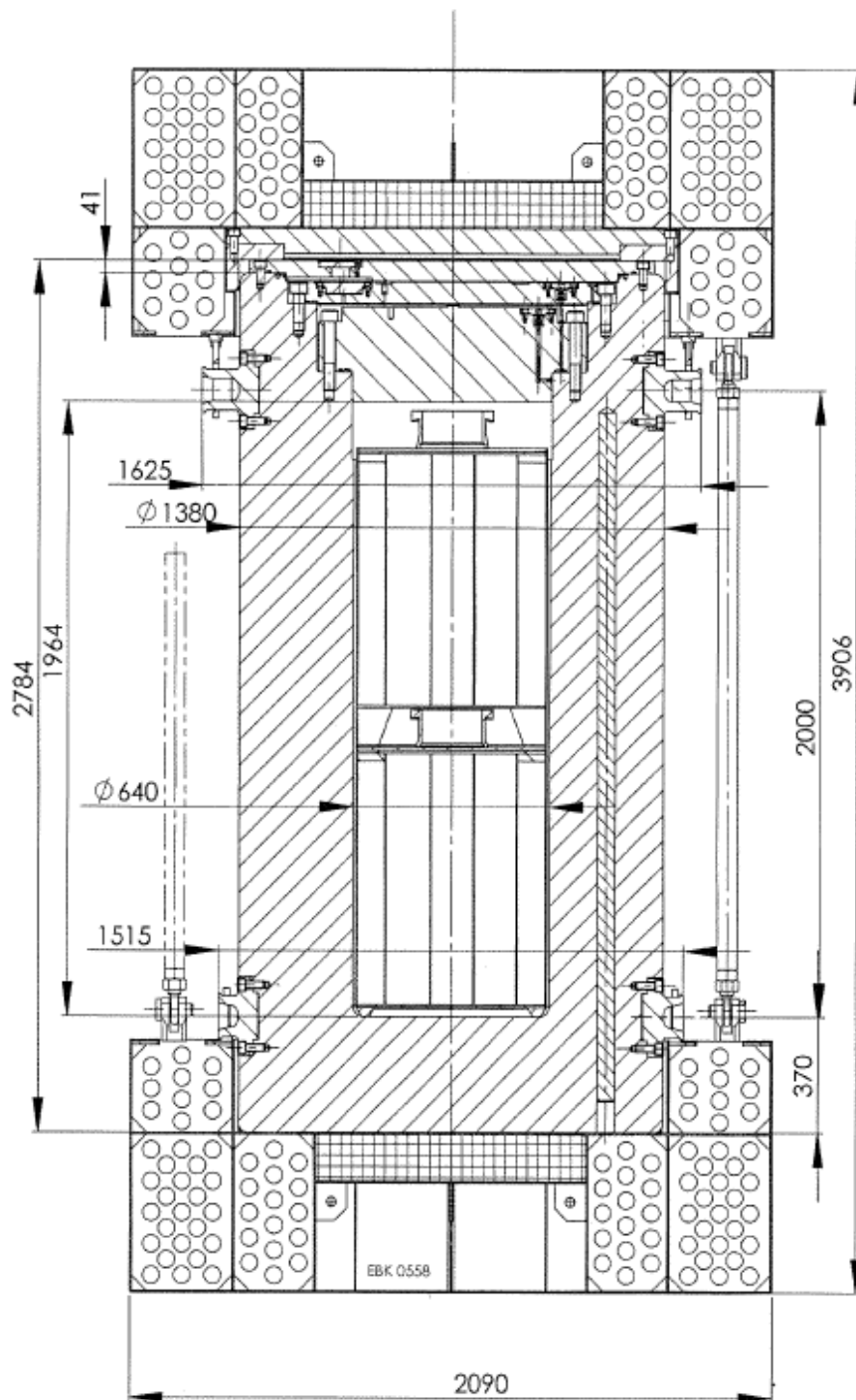
Loading:

- a) THTR canister with max. 2320 fuel elements / operating elements
- b) 2 AVR canisters with a total of max. 1900 fuel elements / operating elements

Max. transport mass (with protection plate and shock absorbers):

loaded: (THTR debris canister)	32,100 kg
not loaded	31,210 kg

GNS	CASTOR [®] THTR/AVR Transport configuration	Fig. 1
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Loading:

2 Burn-up measuring reactor fuel assembly storage frame casks (ABL)

Max. transport mass (with protection plate and shock absorbers):

loaded (2 ABL)	32,100 kg
not loaded	31,210 kg

GNS	CASTOR [®] THTR/AVR Transport configuration	Fig. 2
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Type List

For Transport and Storage Cask CASTOR® THTR/AVR

Casks of type CASTOR® THTR/AVR manufactured according to the following parts lists correspond to the packaging design mentioned in this Certificate of Approval (see also no. 2, 3 and 7 of the conditions and obligations).

Revision of parts list	Release by BAM
500.07/3, Rev.4 ^{1,2)}	Telefax of May 30 th 1989, reference: 1.52 Kr/Swi (250) in connection with test certificate, file reference: 1.5/2506 of March 18 th 1987
500.07/3, Rev.5 ^{1,2)}	Telefax of October 26 th 1990, fax registr. no.: 710 + 711
500.07, Rev.7 ^{1,2)}	Telefax of June 28 th 1991 (Laboratory 1.61)
500.07/1, Rev. 12 ^{1,2)}	with (BAM 9.31) Stamp on August 20 th 1993
500.07/1, Rev.13 ^{1,2)}	Expert report of June 16 th 1994 (Ref no.: 9.31/Ma/Eck/16)
500.007.001-001/1, Rev. 0	Test certificate of October 31 st 2006 (Ref no.: III.3/20978)

1) Only shock absorbers according to the above-stated parts list 500.007.001-001/1, Rev. 0 shall be used.

2) The use of screws in the qualities A2-70 and A4-70 for Item 39 of the above-mentioned parts lists is not admissible.

Salzgitter, January 24th 2017

On behalf of

/signature/

Börst

/seal/ Federal Office for the Safety of Nuclear Waste Management



U.S. Department
of Transportation

East Building, PHH-23
1200 New Jersey Avenue SE
Washington, D.C. 20590

**Pipeline and
Hazardous Materials
Safety Administration**

CERTIFICATE NUMBER: USA/0808/B(U)F-96, Revision 0

ORIGINAL REGISTRANT(S):

Dr. James M. Shuler
Manager, Packaging Certification Program
Department of Energy
U.S. Department of Energy
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Washington, DC 20585