



UFMG
II SEMANA DE ENGENHARIA NUCLEAR

08.10.2014



Ministério da
Ciência, Tecnologia
e Inovação



MINAS GERAIS



586.528 km²

FRANÇA

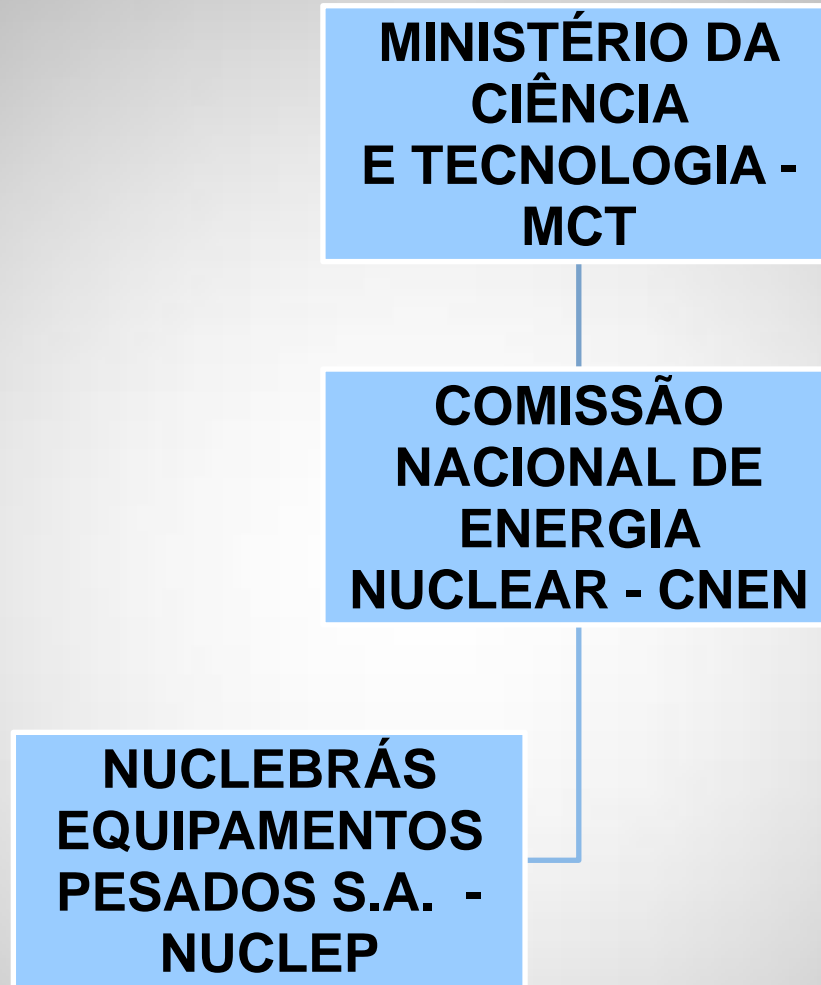


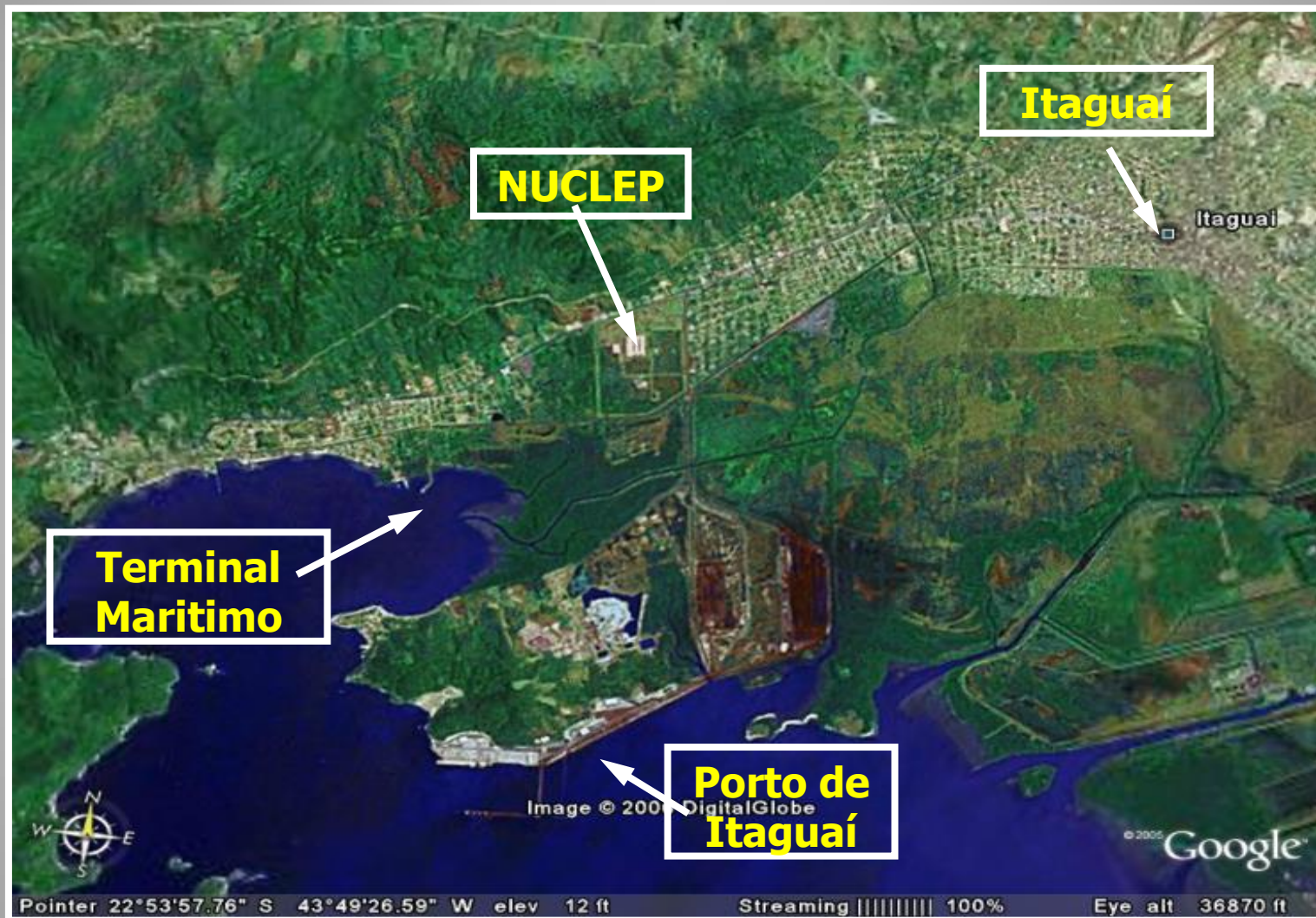
640.679 km²

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2. COMPONENTES NUCLEARES JÁ PRODUZIDOS
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6. FUTURAS CENTRAIS NUCLEARES NO BRASIL

1. NUCLEP – A EMPRESA





PRINCIPAIS ÁREAS DE ATUAÇÃO

- COMPONENTES PESADOS PARA CENTRAIS NUCLEARES
 - CASCOS DE SUBMARINOS
 - VASOS DE PRESSÃO & TROCADORES DE CALOR
 - ESTRUTURAS PARA PLATAFORMAS OFFSHORE
 - USINAGEM DE GRANDES ESTRUTURAS E EQUIPAMENTOS
-

INÍCIO DAS OPERAÇÕES: 1980

1050 COLABORADORES



Ministério da
Ciência, Tecnologia
e Inovação





CERTIFICATE OF AUTHORIZATION

This certificate accredits the named company as authorized to use the indicated symbol of the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the Code symbol and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this symbol shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY: NUCLEBRAS EQUIPAMENTOS PESADOS S/A - NUCLEP
AVENIDA GENERAL EUCLYDES DE OLIVEIRA FIGUEIREDO, 200
ITAGUAI - RIO DE JANEIRO 23825-410
BRAZIL

SCOPE:

CLASS 1, 2, 3, CS & MC FABRICATION WITHOUT DESIGN RESPONSIBILITY AND WITH DESIGN RESPONSIBILITY FOR APPURTENANCES AND SUPPORTS (SUPPORTS LIMITED TO 1998 EDITION, 1998 ADDENDA AND EARLIER EDITIONS AND ADDENDA OF THE CODE) AT THE ABOVE LOCATION ONLY

AUTHORIZED: AUGUST 8, 2002
EXPIRES: AUGUST 8, 2005
CERTIFICATE NUMBER: N-3098

Paulo S. Zanin

CHAIRMAN OF THE BOILER AND PRESSURE VESSEL COMMITTEE

Alan Bar

DIRECTOR, ACCREDITATION AND CERTIFICATION

The American Society of Mechanical Engineers



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COMPANY: NUCLEBRAS EQUIPAMENTOS PESADOS S/A - NUCLEP
AVENIDA GENERAL EUCLYDES DE OLIVEIRA FIGUEIREDO, 200
ITAGUAI - RIO DE JANEIRO 23825-410
BRAZIL

SCOPE:

CLASS 1, 2, 3, CS & MC SHOP ASSEMBLY AT THE ABOVE LOCATION AND FIELD INSTALLATION AT FIELD SITES ACCREDITED BY THE SOCIETY

AUTHORIZED: AUGUST 8, 2002
EXPIRES: AUGUST 8, 2005
CERTIFICATE NUMBER: N-3097

Paulo S. Zanin

CHAIRMAN OF THE BOILER AND PRESSURE VESSEL COMMITTEE

Alan Bar

DIRECTOR, ACCREDITATION AND CERTIFICATION

The American Society of Mechanical Engineers



CERTIFICATE OF ACCREDITATION

This certificate accredits the named company as having had the adequacy of their quality assurance program verified for the scope of the activity shown below in accordance with the applicable rules of the Boiler and Pressure Vessel Code of the American Society of Mechanical Engineers (ASME). This certificate does not include authorization to use a code symbol stamp. The accreditation granted by this certificate is subject to the provisions of the agreement set forth in the application.

COMPANY: NUCLEBRAS EQUIPAMENTOS PESADOS S/A - NUCLEP
AVENIDA GENERAL EUCLYDES DE OLIVEIRA FIGUEIREDO, 200
ITAGUAI - RIO DE JANEIRO 23825-410
BRAZIL

SCOPE:

CLASS 1, 2, 3 & MC FABRICATION OF SUPPORTS WITH AND WITHOUT DESIGN RESPONSIBILITY AT THE ABOVE LOCATION ONLY

AUTHORIZED: AUGUST 8, 2002
EXPIRES: AUGUST 8, 2005
CERTIFICATE NUMBER: N-3099

Paulo S. Zanin

CHAIRMAN OF THE BOILER AND PRESSURE VESSEL COMMITTEE

Alan Bar

DIRECTOR, ACCREDITATION AND CERTIFICATION

The American Society of Mechanical Engineers



CERTIFICADO

DQS do Brasil S/C Ltda.

NUCLEBRAS EQUIPAMENTOS PESADOS S.A. - NUCLEP

R. General Euclides de Oliveira Figueiredo, 200
23825-410 Itaguaí - RJ
Brasil

ISO 9001

Projetar, desenvolver, fabricar, comercializar e instalar componentes mecânicos pesados para a área nuclear e atividades afins, incluindo-se nisso: sistemas, sub-sistemas mecânicos, caldeiras, vasos de pressão, reatores e torres de processo para todo o tipo de indústria e casos ressaltados de subprodutos

Implementado e mantido em

Sistema de Gestão da Qualidade.

Ativado de uma auditoria, documentada em um relatório, foi comprovado que esse sistema de gestão de qualidade cumpre os requisitos da seguinte norma:

ISO 9001 : 2000

versão: setembro 2000

Este certificado é válido até 05-10-2008
Número do certificado 281000 QM
São Paulo, Brasil 23-10-2003

Paulo S. Zanin

Dr. Eng. H. Faria
Membro do Conselho

DQS do Brasil S/C Ltda.

Av. Adolpho Pessoa, 1011 - 1º andar - CEP: 04531-001 - São Paulo - SP - Brasil
CNPJ nº 06.908.000/0001-00

Av. Adolpho Pessoa, 1011 - 1º andar - CEP: 04531-001 - São Paulo - SP - Brasil
CNPJ nº 06.908.000/0001-00



CERTIFICADOS DE QUALIDADE



CERTIFICATE OF AUTHORIZATION

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COMPANY: NUCLEBRAS EQUIPAMENTOS PESADOS S.A.
AVENIDA GENERAL EUCLYDES DE OLIVEIRA FIGUEIREDO, 200
ITAGUAI, RIO DE JANEIRO 23825-410
BRAZIL

SCOPE:

MANUFACTURE OF PRESSURE VESSELS AT THE ABOVE LOCATION AND FIELD SITES CONTROLLED BY THE ABOVE LOCATION

AUTHORIZED: NOVEMBER 27, 2001
EXPIRES: AUGUST 18, 2004
CERTIFICATE NUMBER: 24.346

Paulo S. Zanin

CHAIRMAN OF THE BOILER AND PRESSURE VESSEL COMMITTEE

Alan Bar

DIRECTOR, ACCREDITATION AND CERTIFICATION

The American Society of Mechanical Engineers



CERTIFICATE OF AUTHORIZATION

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COMPANY: NUCLEBRAS EQUIPAMENTOS PESADOS S.A.
AVENIDA GENERAL EUCLYDES DE OLIVEIRA FIGUEIREDO, 200
ITAGUAI, RIO DE JANEIRO 23825-410
BRAZIL

SCOPE:

MANUFACTURE OF PRESSURE VESSELS AT THE ABOVE LOCATION AND FIELD SITES CONTROLLED BY THAT LOCATION

AUTHORIZED: NOVEMBER 27, 2001
EXPIRES: AUGUST 18, 2004
CERTIFICATE NUMBER: 24.345

Paulo S. Zanin

CHAIRMAN OF THE BOILER AND PRESSURE VESSEL COMMITTEE

Alan Bar

DIRECTOR, ACCREDITATION AND CERTIFICATION

The American Society of Mechanical Engineers



CERTIFICADO

A Eletrobrás Termonuclear S/A - ELETRONUCLEAR
certifica que o Sistema de Garantia da Qualidade da

NUCLEP - Nuclebrás Equipamentos Pesados S/A

atende às normas CNEN-NN-1.16 e NBR ISO 9001, onde aplicável,
para o fornecimento de itens para as Usinas Nucleoeletricas de Angra 2 & 3.
O presente certificado é válido até 05 / 09 / 2004.

Rio de Janeiro, RJ, 22 / 10 / 2002

Sérgio Dantas de Brito Lima
Sérgio Dantas de Brito Lima
Auditor Líder

Maurício Rondon Mirilli
Maurício Rondon Mirilli
Gerente de Garantia da Qualidade

ELETRONUCLEAR

2. COMPONENTES NUCLEARES JÁ PRODUZIDOS



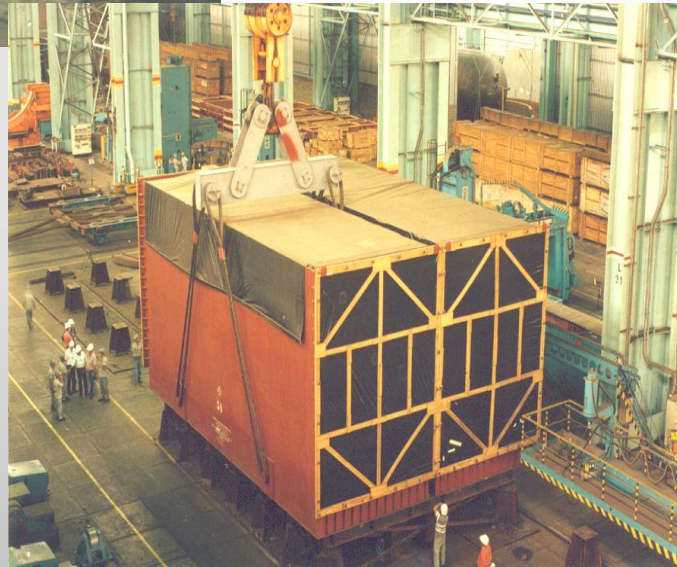
PRESSURIZADOR – ANGRA 3



FABRICAÇÃO DE COMPONENTES PESADOS PARA CENTRAIS NUCLEARES



**ACUMULADORES
PARA ANGRA 2**



**CONDENSADORES
PARA ANGRA 2**



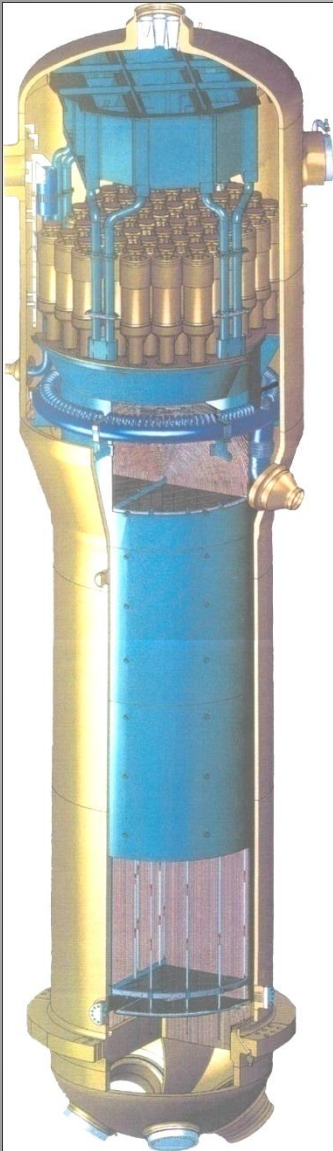
**RACKS
SUPERCOMPACTOS
PARA ANGRA 2**

GERADORES DE VAPOR SUBSTITUTOS PARA ANGRA 1

PROJETO: AREVA NP SAS

FABRICAÇÃO: NUCLEP

PESO INDIVIDUAL: 335 tons



SALA LIMPA



Temperatura: 24°C
Umidade relativa: 50%
Pressão: 1.5 mm ca
Classe: 100.000
Trocas de ar: 10 / h

CARACTERÍSTICAS DA SOLDAGEM

- 52 procedimentos de solda qualificados
- Material de Base: ASME SA 508 Gr. 3 Cl. 2
- Processos: SAW, SMAW, FCAW, GTAW.
- Revestimentos de aço inoxidável
- Revestimentos de liga de níquel
- Soldas tubo-espelho (TIG Orbital)



MATERIAL DE BASE

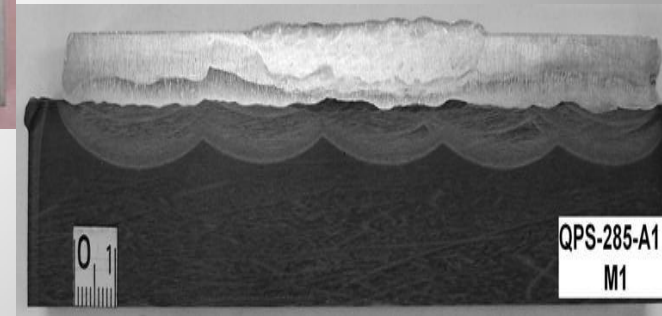
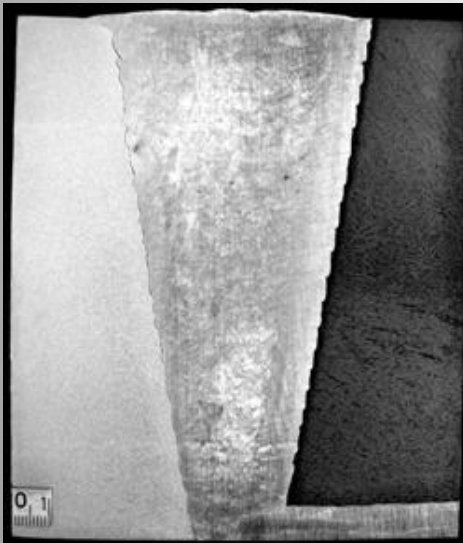
Aço ASME SA 508 Gr.3 Cl. 2

Classificação ASME: P No.3 / Gr. No.3 (0.75Ni - 0.5Mo - Cr - V)

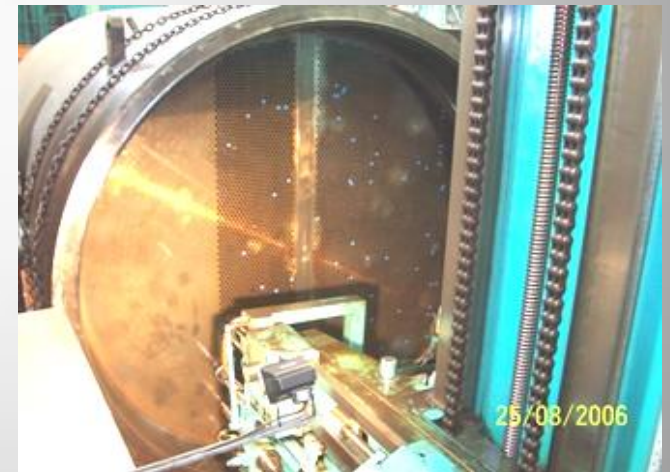
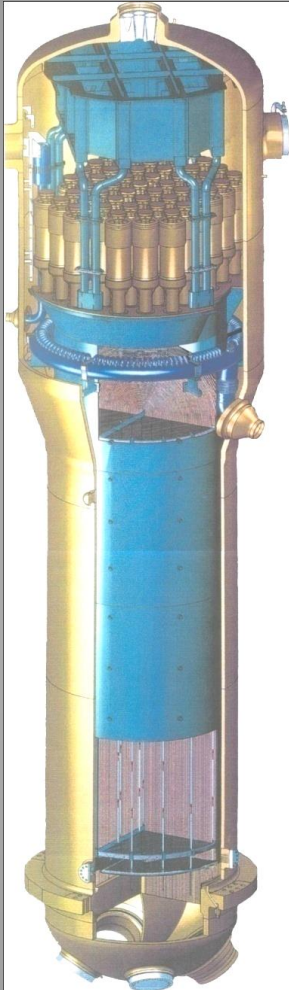
Forjado, temperado e revenido.

Tensão de escoamento: 448 Mpa (65.160 psi) - RT

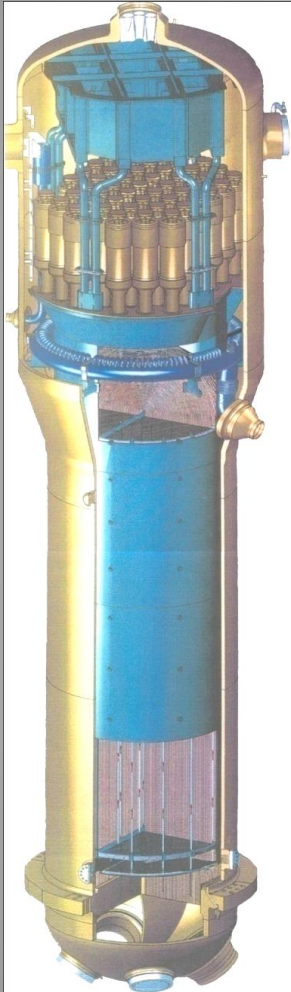
➤ Alta tenacidade, Alta resistência, Excelente soldabilidade



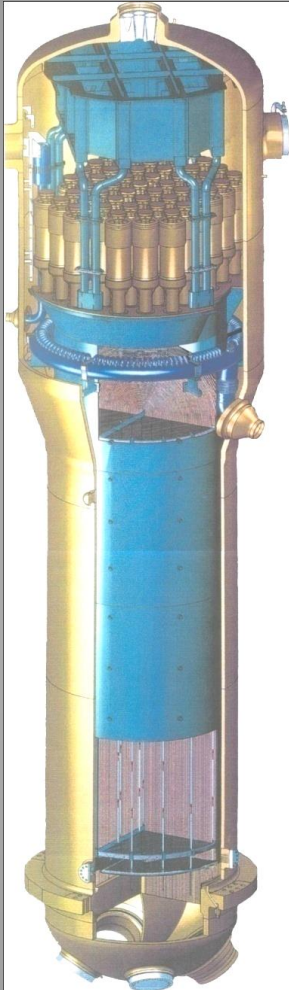
PARTE INFERIOR



TAMPO INFERIOR



PARTE INTERMEDIÁRIA



PARTE SUPERIOR



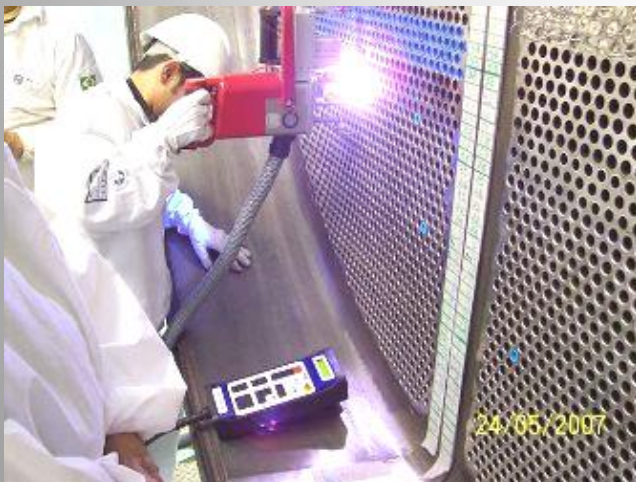
INTERNOS



TRANSFERÊNCIA PARA A SALA LIMPA



ATIVIDADES NA SALA LIMPA





ÚLTIMA SOLDA CIRCUNFERENCIAL





EDDY CURRENT TEST



TESTE HIDROSTÁTICO

Pressão de teste: 214 bar / 105 bar

CONCLUSÃO DA FABRICAÇÃO: 28 MESES APÓS O PRIMEIRO CORTE

TRANSPORTE PARA A USINA ANGRA 1

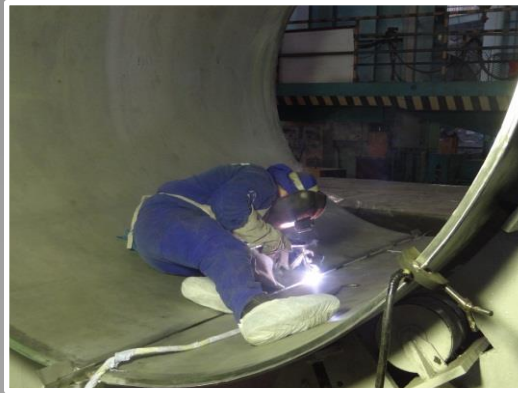


VIDA ÚTIL DA USINA: + 20 ANOS

AUMENTO DE POTÊNCIA DA USINA: 6,5%



3. COMPONENTES NUCLEARES EM FABRICAÇÃO PARA ANGRA 3



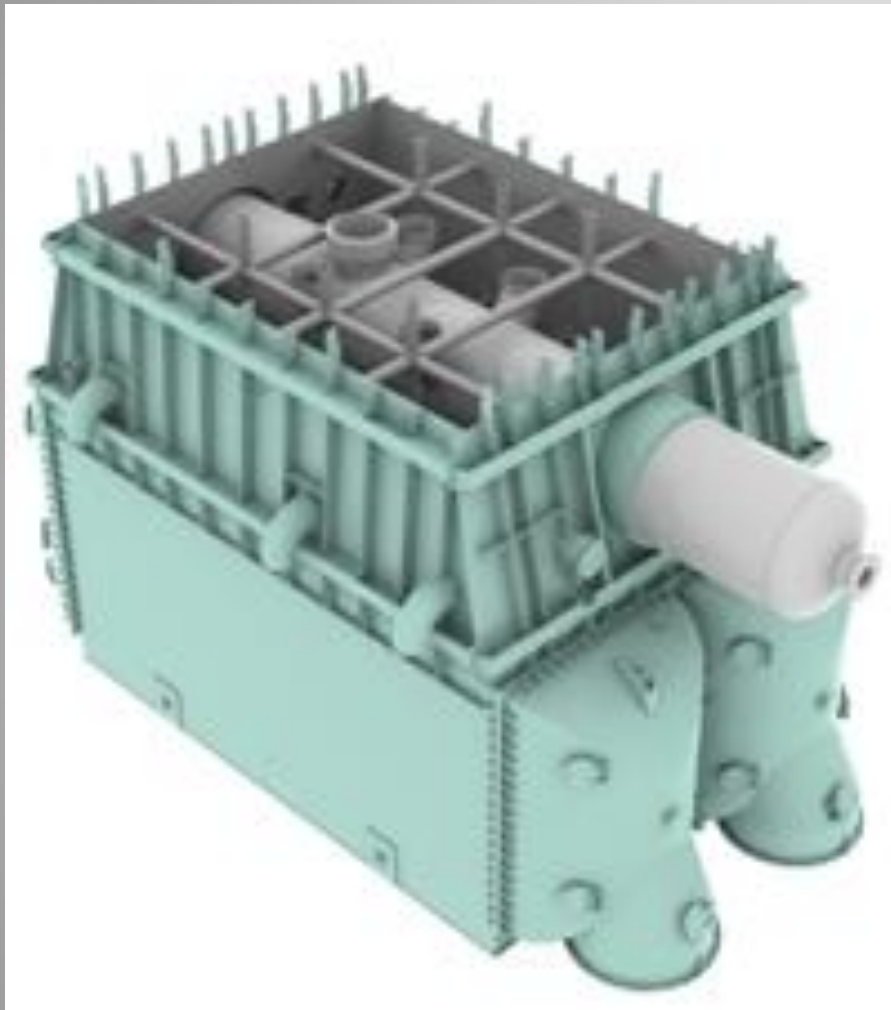
ACUMULADORES



MATERIAL DE BASE: AÇO INOXIDÁVEL AUSTENÍTICO TP. 347

ENTREGA PROGRAMADA PARA JANEIRO / 2015

CONDENSADORES



PROJETO: SIEMENS - KWU
FABRICAÇÃO: NUCLEP
PESO INDIVIDUAL: 500 tons



CONDENSADORES

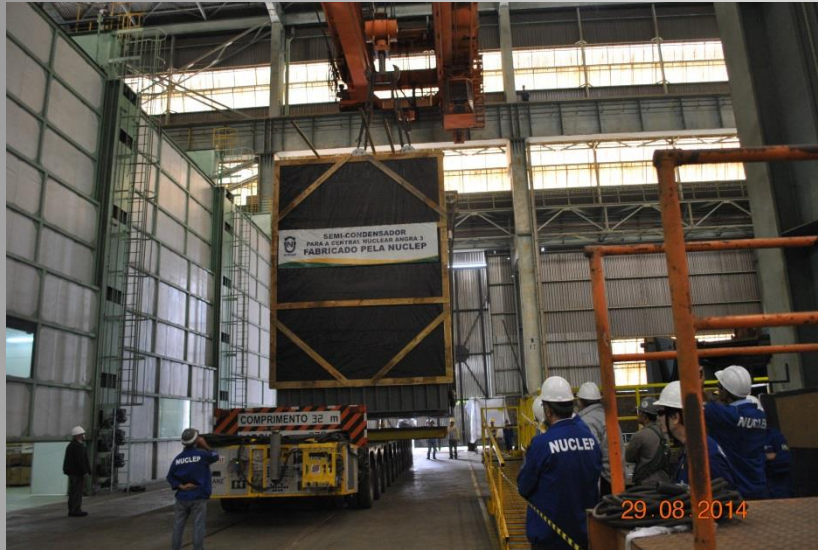


MAG 30: SETEMBRO / 2014

MAG 20: ABRIL / 2015

MAG 10: OUTUBRO / 2015

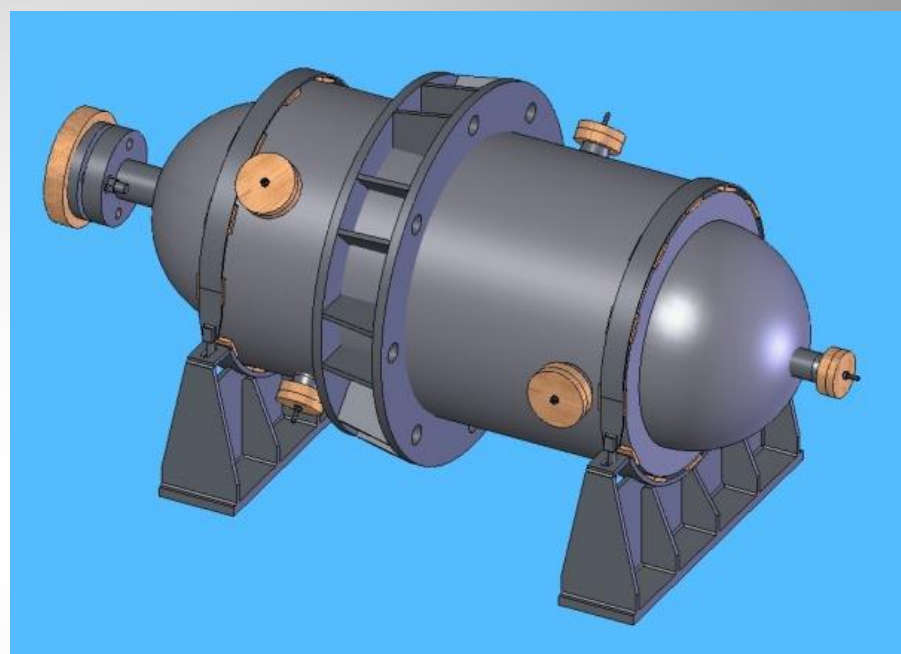
CONDENSADORES



4. COMPONENTES NUCLEARES PARA A MARINHA DO BRASIL



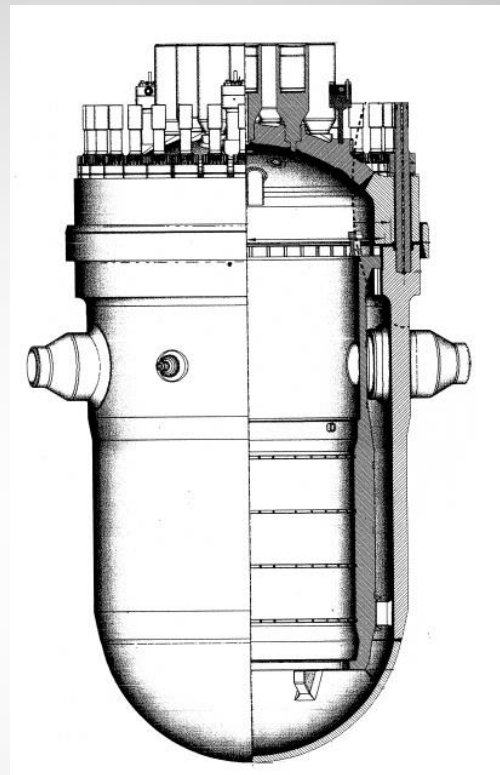
TANQUES DE COMPENSAÇÃO DO SISTEMA DE RESFRIAMENTO DE EMERGÊNCIA



VASO DESIONIZADOR PARA PURIFICAÇÃO DO CIRCUITO PRIMÁRIO

LABGENE - ENTREGA PREVISTA PARA MARÇO / 2015

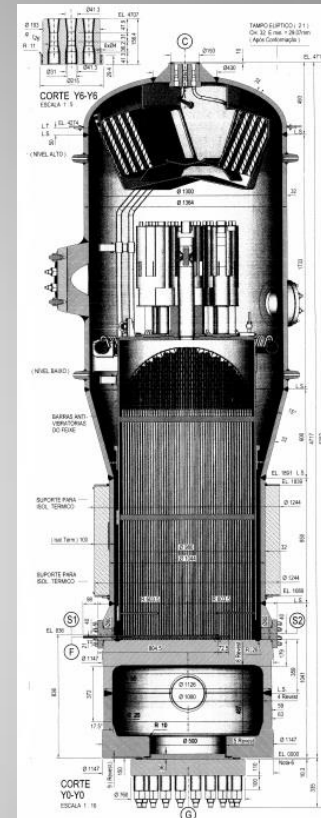
COMPONENTES PARA PROPULSÃO NUCLEAR DO SUBMARINO NUCLEAR BRASILEIRO



VASO DE PRESSÃO DO REATOR
Peso: 29.200 kg



GERADORES DE VAPOR
Peso individual: 10.775 kg



5. DESENVOLVIMENTO TECNOLÓGICO COM A INB / CNEN

CILINDROS PARA ARMAZENAGEM E TRANSPORTE DE HEXAFLUORETO DE URÂNIO (UF₆)

CILINDRO 30B



CILINDRO 48Y



6. FUTURAS CENTRAIS NUCLEARES NO BRASIL



OBRIGADO PELA ATENÇÃO !

carlos.frederico@nuclep.gov.br

WWW.NUCLEP.GOV.BR