

DE LA RECHERCHE À L'INDUSTRIE

**cea den**

**TOWARDS INTEGRATING EUROPEAN  
INFRASTRUCTURES FOR STARTING  
COMMUNITIES: PHYSICAL MASS SEPARATION TO  
FOSTER A NEW RESEARCH ERA WITH EMERGING  
MEDICAL ISOTOPES**

**INFRAIA KICK-OFF MEETING**

**30<sup>TH</sup> APRIL 2019, ERICE**

**JULES HOROWITZ REACTOR (JHR)  
CONTRIBUTION**

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***Presented by U. KOESTER  
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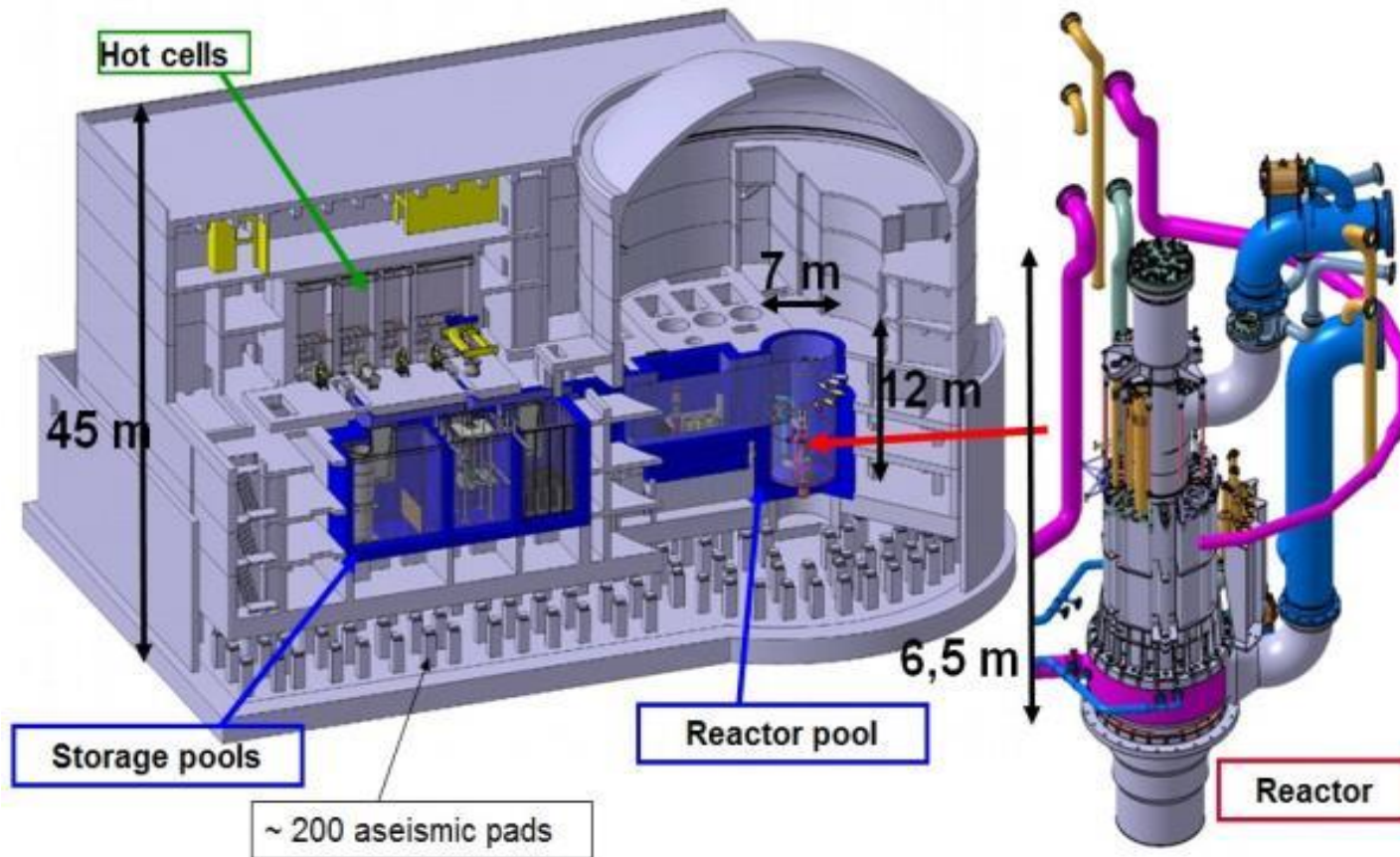
- Material Testing Reactor currently under construction at the CEA-Cadarache (France)



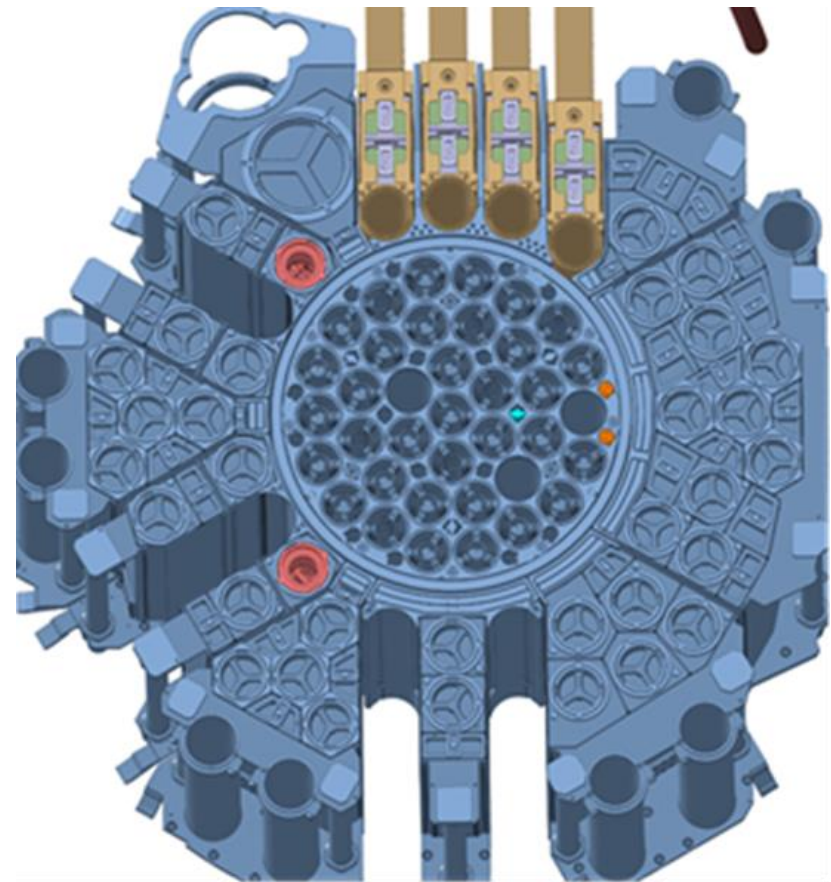
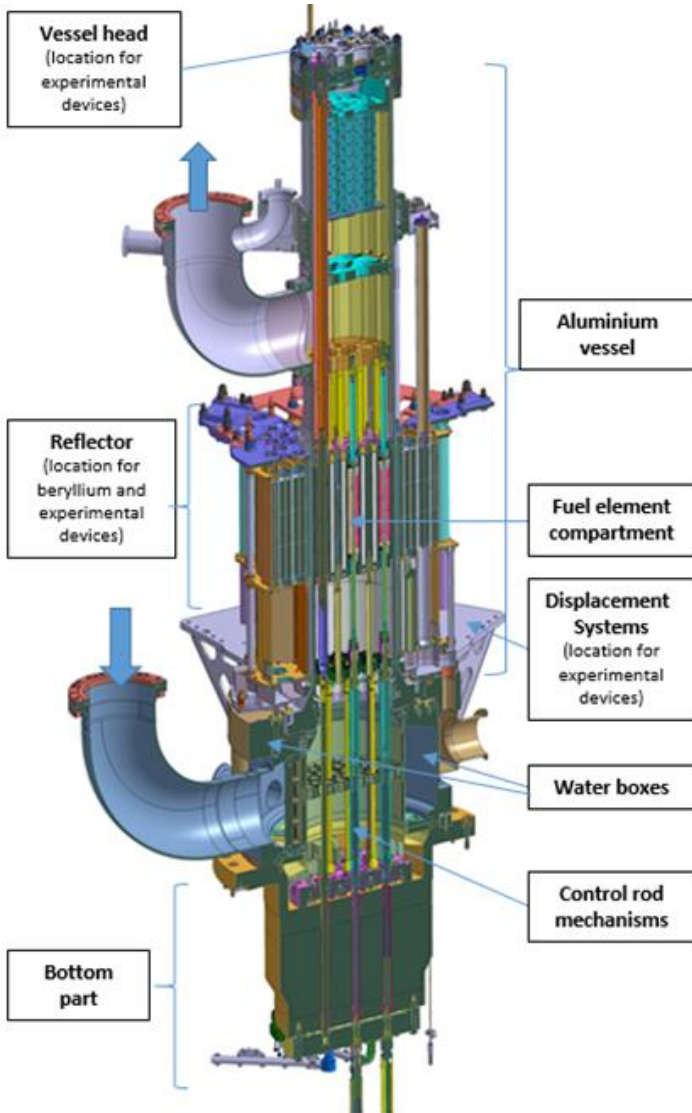
# Jules Horowitz Reactor



- Material Testing Reactor : 100 MW thermal => intense neutrons source
- Design to simultaneously accommodate a large number of core and reflector experiments, with a very large range of thermal and fast flux level



## JHR Pile-Block



- Potential irradiation rigs according to needs.

- Inside the vessel
  - In the Be reflector

- Large neutron energy spectrum

- Large neutron fluxes range

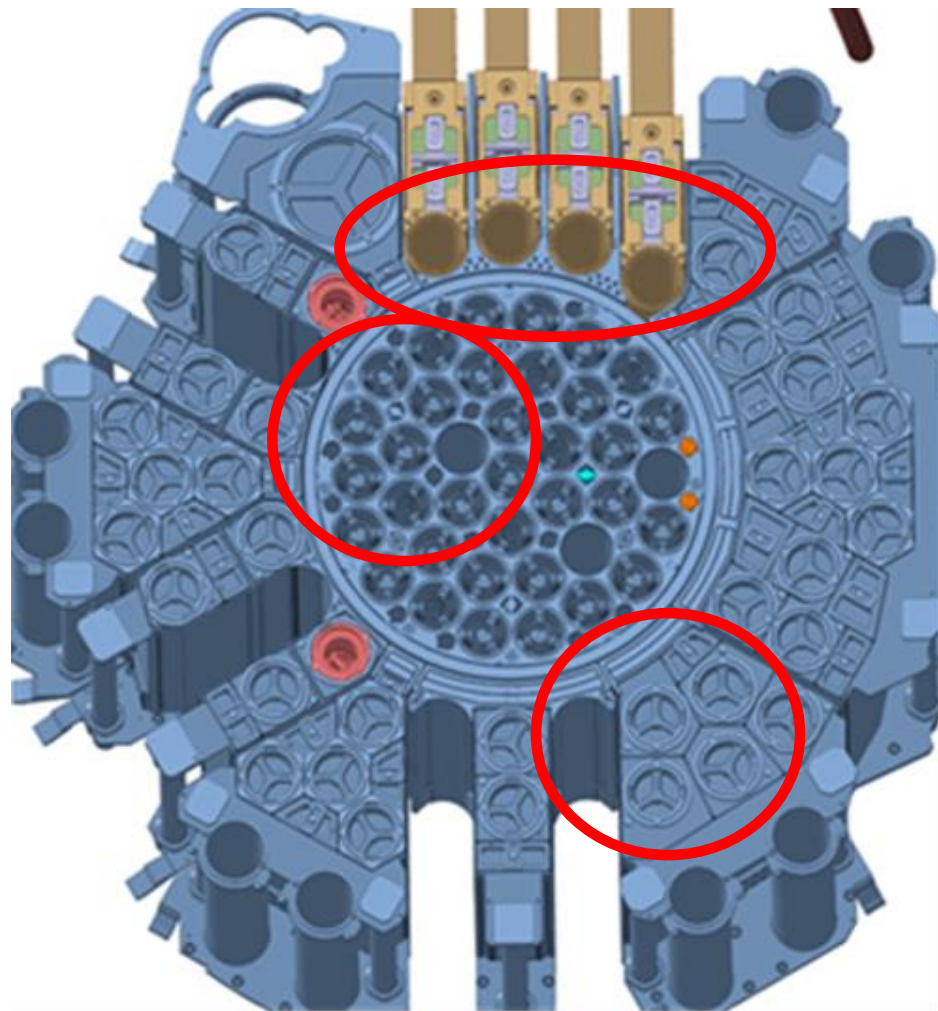
- JHR could produce (as examples):

- by fission  $^{131}\text{I}$ ,  $^{99}\text{Mo}$  and  $^{133}\text{Xe}$ .
  - by neutron activation  $^{90}\text{Y}$ ,  $^{89}\text{Sr}$ ,  $^{125}\text{I}$ ,  $^{153}\text{Sm}$ ,  $^{161}\text{Tb}$ ,  $^{166}\text{Ho}$ ,  $^{169}\text{Er}$ ,  $^{177}\text{Lu}$ ,  $^{186}\text{Re}$ ,  $^{188}\text{W}/^{188}\text{Re}$ ,  $^{192}\text{Ir}$ ,  $^{103}\text{Pd}$ ,  $^{223}\text{Ra}$ ,  $^{225}\text{Ac}^*$  (as well as  $^{131}\text{I}$ ,  $^{99}\text{Mo}$  and  $^{133}\text{Xe}$ ).

- Depending on radioisotopes, potential production per cycle (~25 days)

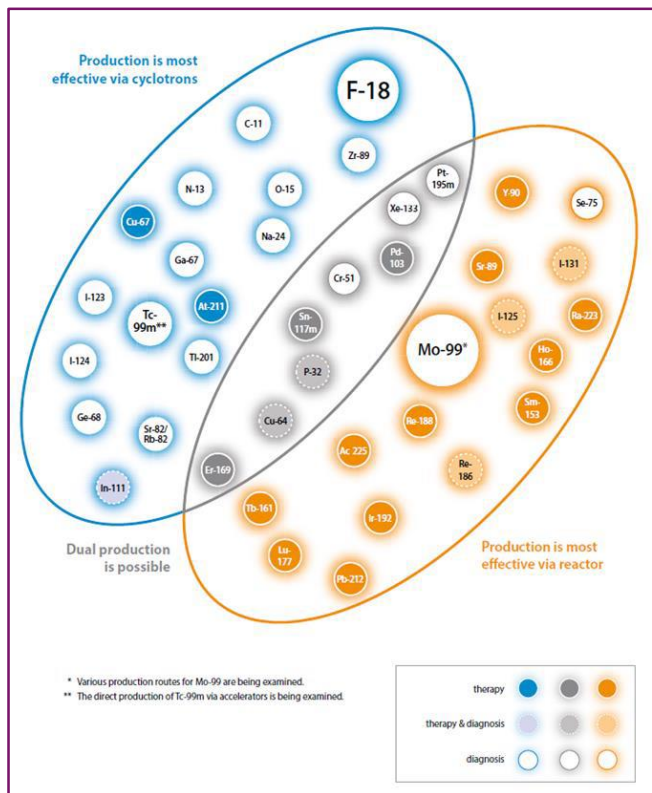
- => from MBq to PBq

- => with high specific activities



# Conclusion

- With the construction of Jules Horowitz Reactor, CEA could contribute, as soon as possible after the first criticality, to the radio-isotopes production.
- JHR could contribute to our starting community:
  - As a first step, by integrating our needs in its start-up phase,
  - As a second step, by producing raw materials.



# Thank you for your Attention



N° 2008/33470.4

**Certificat**  
Certificate

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AFNOR Certification certifie que le système de management mis en place par :  
AFNOR Certification certifies that the management system implemented by:

**COMMISSARIAT A L'ENERGIE ATOMIQUE  
ET AUX ENERGIES ALTERNATIVES  
DIRECTION DE L'ENERGIE NUCLEAIRE  
pour son Centre de Cadarache  
et ses unités implantées sur le Centre de Grenoble**

pour les activités suivantes :  
for the following activities:

**RECHERCHE ET DEVELOPPEMENT POUR L'ENERGIE NUCLEAIRE.  
CONCEPTION, REALISATION ET EXPLOITATION D'INSTALLATIONS.  
ASSAINISSEMENT ET DEMANTELEMENT D'INSTALLATIONS NUCLEAIRES.  
SOUTIEN TECHNIQUE ET ADMINISTRATIF AUX ORGANISMES HEBERGES.**

**RESEARCH AND DEVELOPMENT FOR NUCLEAR ENERGY.  
DESIGN, DEVELOPMENT AND OPERATION OF INSTALLATIONS.  
CLEAN-UP AND DISMANTLING OF NUCLEAR INSTALLATIONS.  
TECHNICAL AND ADMINISTRATIVE SUPPORT TO EXTERNAL ORGANIZATIONS PRESENT ON THE SITE.**

a été évalué et jugé conforme aux exigences requises par :  
has been assessed and found to meet the requirements of:

**ISO 9001 : 2015 - ISO 14001 : 2015 - OHSAS 18001 : 2007**

et est déployé sur les sites suivants :  
and is developed on the following locations:

CEA Cadarache FR 13108 SAINT-PAUL-LEZ-DURANCE CEDEX  
CEA Grenoble 17, rue des Martyrs FR 38054 GRENOBLE CEDEX 9

Le détail des activités et sites certifiés par norme est mentionné sur les certificats suivants :  
The description of certified activities and locations per standard is mentioned on the following certificates:

Certificat ISO 9001 : 2015 n° 24008  
Certificat ISO 14001 : 2015 n° 29563  
Certificat OHSAS 18001 : 2007 n° 33469

Ce certificat est valable à compter du (année/mois/jour)  
This certificate is valid from (year/month/day)

2017-12-29

Jusqu'au  
Until

2020-02-10