



Fuel Service Resources

Man Power

KEPCO NF fuel service department has 12 professionals and 5 part-time staffs of service personnel who have average over than 10 years of experiences in the field, and who are all certified to ASME standards for non-destructive examination.

Engineering Tools

For the developments of equipment, software simulation and technical upgrade, the following engineering tools are applied :

- Auto CAD and SolidWorks for mechanical design and analysis
- LabVIEW and Visual Basic for control system design and analysis in virtual space.

Facility

KEPCO NF has a Fuel Service Building for training and equipment developing.

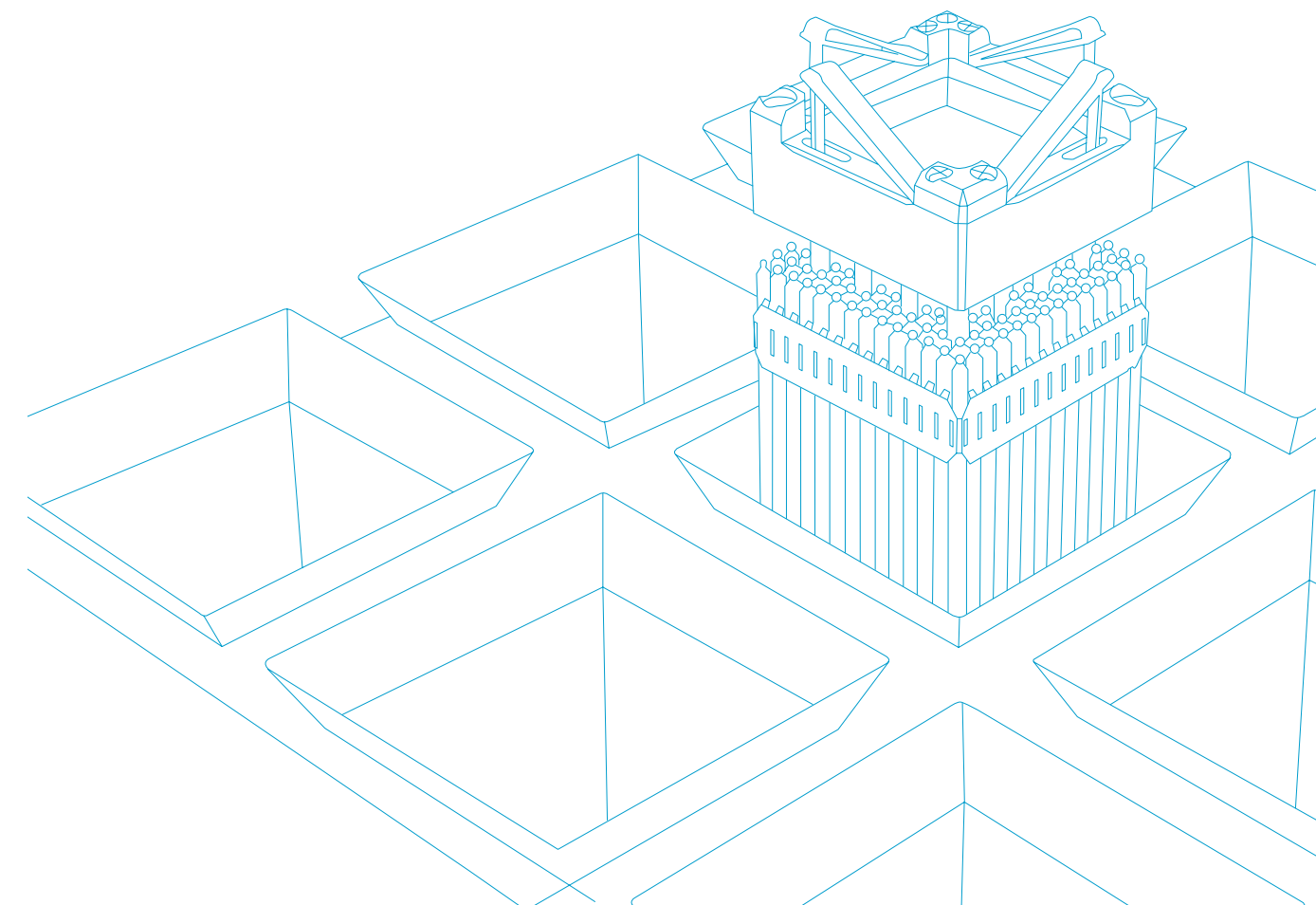
- Number of Floors 3
- Controlled Area 856m²(Training facilities)
- Total Spacer 1,770m²
- Dry pit 5m(W)×8m(L)×5m(H)
- Workshops and component warehouse



KEPCO NUCLEAR FUEL COMPANY, LTD.
1047, Daeduckdaero, Yuseong-gu, Daejeon 305-353, Korea
Tel. +82-42-868-1000 Fax. +82-42-868-1219
<http://www.knfc.co.kr>



Fuel Service activities in KEPCO NF
Fuel Assembly Repair and Poolside Examination



Fuel Service Activities

KEPCO NF has carried out the following fuel service activities since 2000 :

- **Monitoring and Evaluation of coolant activity**
- **Fuel surveillance and Inspection**
- **Fuel reconstitution and reassembly**
- **Root cause analysis of fuel failures**
- **CRUD removing using ultrasonic cleaning system**
- **Fuel Rod & Assembly performance examination**
 - Fuel Rod & Assembly Length
 - Spacer grid width
 - Fuel rod cladding oxide thickness
 - Cladding defects and fretting wear
 - Assembly bow and twist
 - Fuel rod diameter and profilometry
 - Fuel rod bow
- **Development of fuel repair tools and fixtures**
 - Fuel rod storage basket
 - Graphite / Fiber glass pole
 - Fuel rod / assembly repair and handling tools
 - Work platforms, etc.

By ceaseless improving and advancing our methodologies, KEPCO NF is able to offer reliable and accurate services that meet the needs of the nuclear fuel repairs and poolside examinations.

Fuel Service Experiences

As of the end 2007, the following services were provided by KEPCO NF.

22 fuel assemblies were reconstituted.

22 defective fuel assemblies (24 rods) occurred in domestic PWR plants were successfully repaired through 14 campaigns during outages. Generally, the repair is performed in the new fuel elevator in the spent fuel pool or, if unavailable, in a portable fuel repair stand. Fuel Repair typically involves replacing failed fuel rods with stainless steel dummy rods.

110 fuel rods were visually examined.

In order to enhance fuel integrity and analyze fuel failure mechanism, 106 Fuel Rods in 40 FAs (13 units) suspected as failure were accurately examined on their surface conditions at the single rod inspection stand by the camera system.

443 top nozzles were replaced.

To prevent the top nozzle locking screws failure for Vantage 5H fuels, 443 Top nozzles were replaced with new designed nozzles between 2000 and 2002.

25 Fuel Performance Examinations were performed.

For the fuel performance verification of the advanced fuel assembly, PLUS7™ and ACE7™, 25times of poolside examinations were successfully performed at the site.

State-of-the-art equipment

The followings are main equipment which KEPCO NF put into fuel services at nuclear plant sites.

For Fuel Repair

- Underwater color camera systems
- Fuel repair stands for reconstitution and reassembly
- Fuel repair tool sets
- Insert sleeve reforming tools
- Debris removing tools

For Fuel Performance Examination

- Fuel Rod and Assembly Geometric Measurement Equipment
 - Fuel assembly bow, twist and growth
 - Fuel assembly length
 - Fuel rod dimension
 - Grid width
- Eddy Current Inspection System for Cladding Oxide, Defects and Fretting Wear Measurements
- Fuel Rod Withdrawal Force Measurement System
- Ultrasonic cleaning equipment for crud removal