



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 19, 2002

MEMORANDUM TO: Melvyn N. Leach, Chief
Special Projects and Inspection Branch
Division of Fuel Cycle Safety
and Safeguards

THRU: Joseph G. Gitter, Chief 
Special Projects Section
Special Projects and Inspection Branch, FCSS

FROM: Timothy C. Johnson
Senior Mechanical Systems Engineer
Special Projects Section
Special Projects and Inspection Branch, FCSS

SUBJECT: SEPTEMBER 5, 2002, MEETING SUMMARY: LOUISIANA ENERGY
SERVICES PRE-APPLICATION MEETING ON OPERATING
EXPERIENCE AND QUALITY ASSURANCE

On September 5, 2002, U.S. Nuclear Regulatory Commission (NRC) staff met with staff from Louisiana Energy Services (LES) to discuss the LES' operating experience at its three European gas centrifuge plants and its approach for meeting NRC's quality assurance requirements. Those were pre-application discussions related to LES's planned submittal of an application for a gas centrifuge enrichment plant in December 2002. I am attaching the meeting summary for your use. This summary contains no proprietary or classified information.

Docket: 70-3103

Attachment: Louisiana Energy Services
Meeting Summary

cc: William Szymanski/DOE
Rod Krich/Exelon
James Curtiss/W&S
Mario Robles/USEC
George Dials/LES

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DISTRIBUTION: Docket: 70-3103

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*SEE PREVIOUS CONCURRENCE

OFC	SPIB*		SPIB*	2E	SPIB*		SPIB*	
NAME	TCJohnson;dw		KValloch		WSmith		JGiltter	
DATE	09/19/02		09/19/02		09/19/02		09/19/02	

C = COVER

E = COVER & ENCLOSURE

N = NO COPY

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Louisiana Energy Services Pre-Application Meeting Summary

Dates: September 5, 2002

Place: U.S. Nuclear Regulatory Commission (NRC) offices;
Rockville, MD

Attendees: See Attachment 1

Purpose:

The purpose of this meeting was to discuss with Louisiana Energy Services (LES) staff gas centrifuge operating experience at its three European enrichment plants and the LES approach to quality assurance. These discussions are applicable to LES' planned gas centrifuge license application. The meeting agenda is provided in Attachment 2. LES presentation handouts are provided in Attachment 3.

Discussion:

Following introductions, J. Kleisen discussed LES' operating experience at its gas centrifuge enrichment plants at Capenhurst in the United Kingdom, Almelo in The Netherlands, and Gronau in Germany. The three plants have current enrichment capacities of 2.3 million Separative Work Units (SWU), 1.6 million SWU, and 1.35 million SWU, respectively. LES began gas centrifuge enrichment operations in 1972.

One of the most significant changes in LES operations is that its newest plants are designed with feed and withdrawal stations that operate at sub-atmospheric pressures so that no uranium hexafluoride (UF_6) liquid is formed. The only place where UF_6 is a liquid is in the sampling station so that representative samples can be obtained.

During LES operating history, J. Kleisen indicated that there have been no criticality events or events causing personnel overexposures. During the period from 1972 to 1984, there were 13 reportable worker exposure events at the Almelo facility involving releases of small quantities of UF_6 . These releases were due to flange or valve leakage. J. Kleisen stated that there was no impact to the public in any of these releases. In these events, 14 workers were found to have uranium in their urine greater than 50 μg of uranium. After two days, no uranium was detected in urine tests. There have been no reportable events at the Capenhurst or Gronau sites. After 1984, there have been no reportable worker exposure events.

In 1998 and 1999, J. Kleisen stated that there were two releases to the environment at the Almelo facility. During the releases, concentrations were measured to be 0.8 Bq/cubic meter and 1.1 Bq/cubic meter, respectively, for less than one hour. The total release was less than the 24-hour release limit and much less than the annual release limit. The Dutch release limit is 0.5 Bq/cubic meter in 1 hour. These two releases resulted in a modification to the ventilation system design to add carbon and high efficiency particulate air filters.

During the period of operations, there have been no International Atomic Energy Agency reportable events. Also, no gas centrifuge machine failures have resulted in any releases.

J. Kleisen indicated that there have been some small electrical fires at the facilities, but no fires affecting equipment containing UF₆. These electrical fires had no impact on plant operations. The proposed facility in the United States will be designed with fire detection systems and fire sprinkler systems.

J. Kleisen said that several chemicals are used in the plants for water treatment, waste management activities, and for laboratory use. However, the inventories needed are relatively small and the chemicals are not stored in cascade halls or UF₆ feed, withdrawal, and sampling areas.

For its Quality Assurance program, LES will propose to use a program meeting the American Society of Mechanical Engineers (ASME) NQA-1 standard. No exceptions have been currently identified, but if there are exceptions, those will be noted and justified. LES indicated that it would use the 1994 version that is referenced in NUREG-1520, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility." LES staff is preparing a program document for submittal to the NRC prior to submittal of the application.

R. Krich indicated that three companies are involved in the application preparation. These are Urenco, Lockwood Greene (the architect-engineer), and Framatome ANP DE&S (for the safety analysis). NQA-1 audits of the three companies are planned for the fourth quarter 2002. The quality assurance program at Urenco currently complies with International Standards Organization (ISO) 9001 (2000) and ISO 14001 (1996) standards. LES is currently conducting an assessment to determine if there are gaps between these programs and NQA-1-1994. If there are gaps, changes will be made to bring the practices up to NQA-1 standards.

NRC staff indicated that the quality assurance program needs to address quality assurance program requirements in 10 CFR Part 21 and the management measures in 10 CFR Part 70. If a graded system of management measures is proposed, it will need to be consistent with the quality assurance program. LES also needs to address quality assurance for items used to demonstrate defense-in-depth as well as those items relied on for safety (IROFS). In addition, LES needs to ensure that the configuration management approach applies to the entire facility, not just to the IROFS. NRC staff asked that LES consider the 1995 Addenda to NQA-1.

Action Items:

None

Attachments:

1. Attendee List
2. Meeting Notice and Agenda
3. LES Presentation Handouts

Louisiana Energy Services Pre-Application Meeting on
Quality Assurance and Quality Assurance Experience
 Date: September 5, 2002

NAME	AFFILIATION	PHONE	EMAIL ADDRESS
Tim Johnson	NRC	301-415-7299	tdj@nrc.gov
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Rich Kreske	Self	703-242-8057	
Sharon A. Steele	NRC	301-415-7078	ass@nrc.gov
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Fred Burrows	NRC	301-415-8110	fb@nrc.gov
David Brown	NRC	301-415-5257	db@nrc.gov
Rex Weschill	NRC	301-415-6727	rgw@nrc.gov
Rod M. Krich	Exelon Nuclear	630-657-2813	rod.krigh@exeloncorp.com
Robert A. Morgan	Framatom	702-295-5425	

Attachment 1



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 20, 2002

MEETING NOTICE
REVISED

Licensee: Louisiana Energy Services
Suite 610
2600 Virginia Avenue, N.W.
Washington, D.C. 20037

Docket: 70-3103

Date and Time: September 5, 2002, 1:00 p.m.

Location: U.S. Nuclear Regulatory Commission
Two White Flint North Building, Room T- 8A1
11545 Rockville Pike
Rockville, Maryland

Purpose: A discussion on operational experience and LES' approach to a quality assurance program.

NRC Attendees: Joseph Glitter, FCSS/NMSS; Timothy Johnson, FCSS/NMSS; and other technical staff.

Other Attendees: R. Krich/Exelon, C. Andrews/LES; D. Marcelli/Framatone DES; and other technical staff.

Contact: Timothy Johnson, (301) 415-7299, tcj@nrc.gov
Attendance at this meeting by other than those listed above should be made known via phone or email to above contact.

Category: Category 1 Meeting: The public is invited to observe this meeting and will have one or more opportunities to communicate with the NRC after the business portion, but before the meeting is adjourned.

NOTE: NRC Meetings are open for interested members of the public to attend pursuant to the "Enhanced Public Participation in NRC Meetings; Policy Statement," 67 *Federal Register* 36920, May 28, 2002.

Attachment: Meeting Agenda

Attachment 2

AGENDA

Meeting between
Louisiana Energy Services and the
U.S. Nuclear Regulatory Commission
September 5, 2002

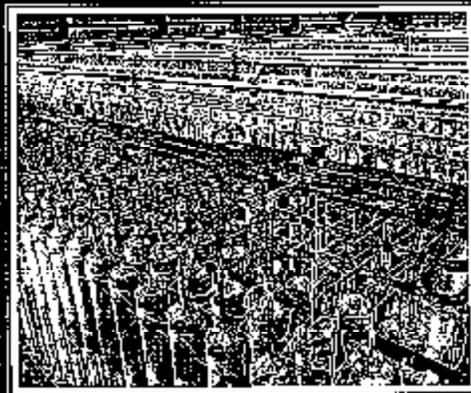
Purpose and Introductions

Discussion of Operational Experience

Discussion of Quality Assurance Program

Summary and Conclusions

30 Years of Urenco Operating Experience



Presentation by Jan Kleisen
September 5, 2002
Rockville, Maryland

Urenco

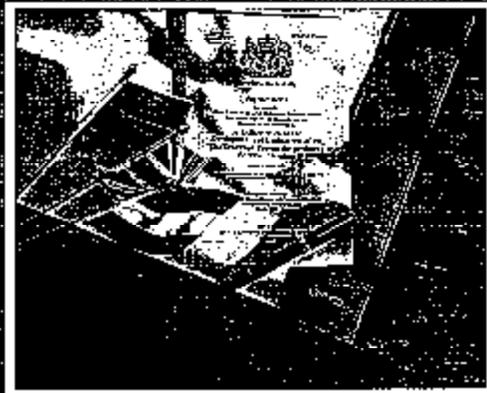
Purpose

To describe operating experience gained over the last 30 years and how lessons learned have been incorporated into the design and operation of current and future enrichment plants

CONTENTS

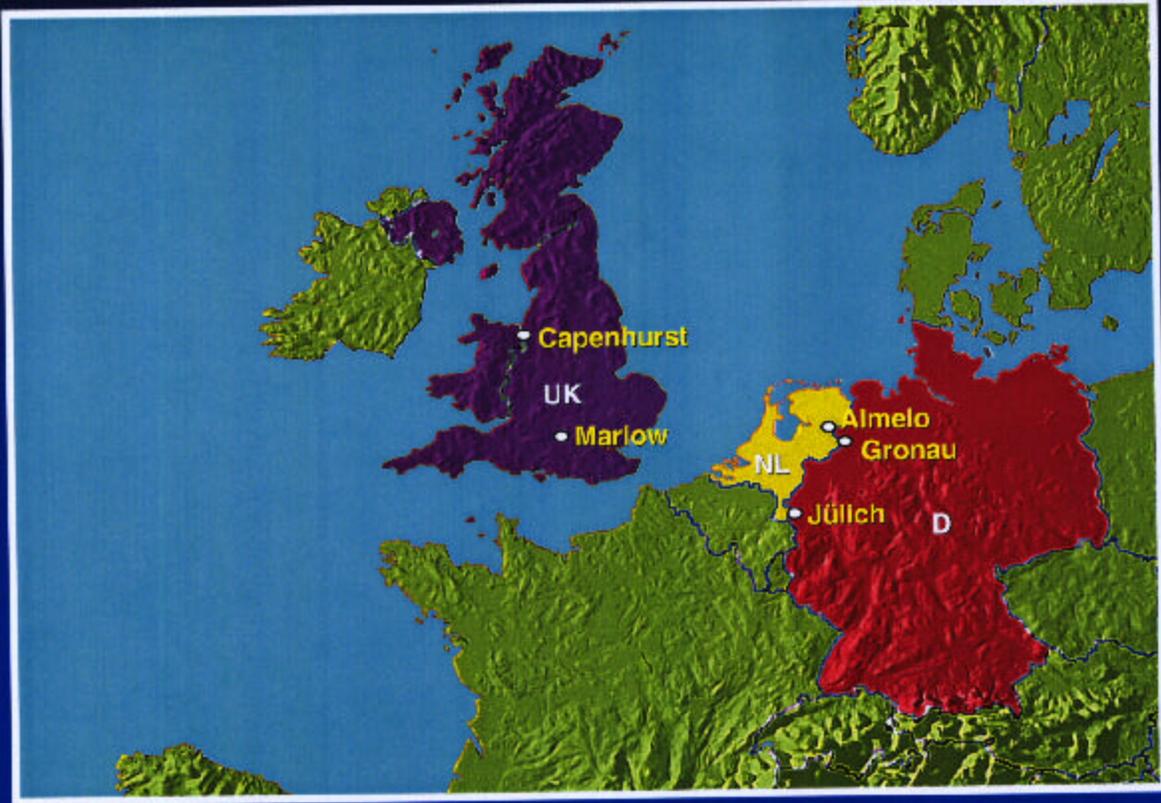
- **History**
- **Plant Structure**
- **SWU Production**
- **Events / Incidents**
- **Lessons Learned**

The Governments of the Netherlands, Germany and United Kingdom signed an Agreement on 4th of March 1970 to collaborate in the development and exploitation of the gas centrifuge process for producing enriched uranium

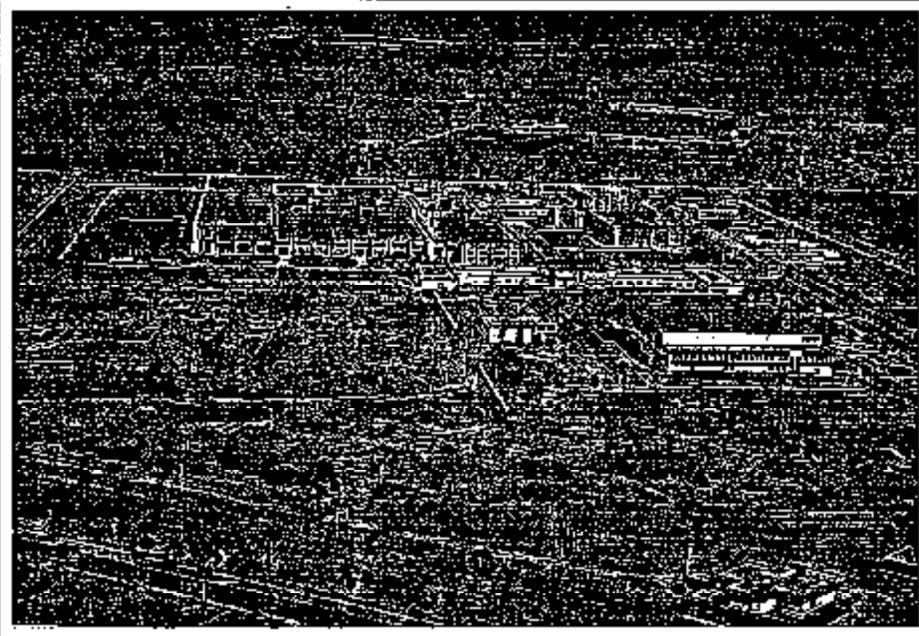


Urenco Locations

Europe



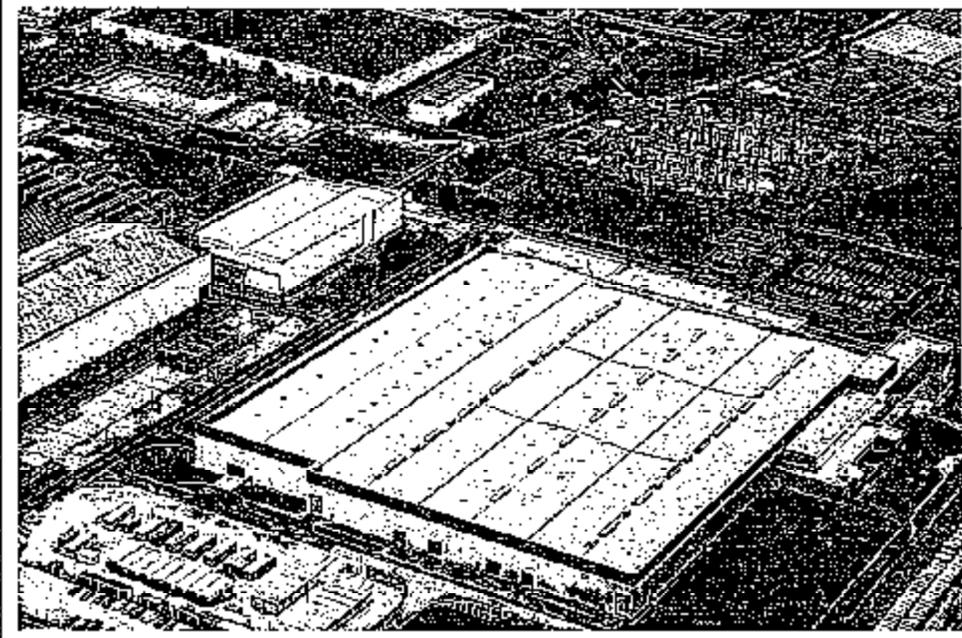
Uranium Enrichment Site Gronau - 1.35 million SWU / yr



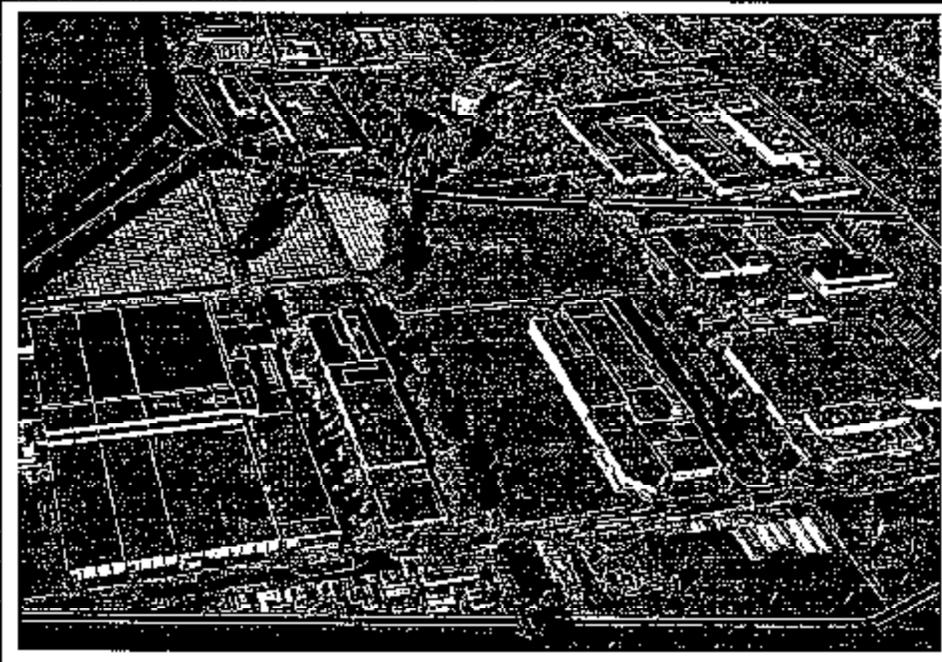
Urenco

8

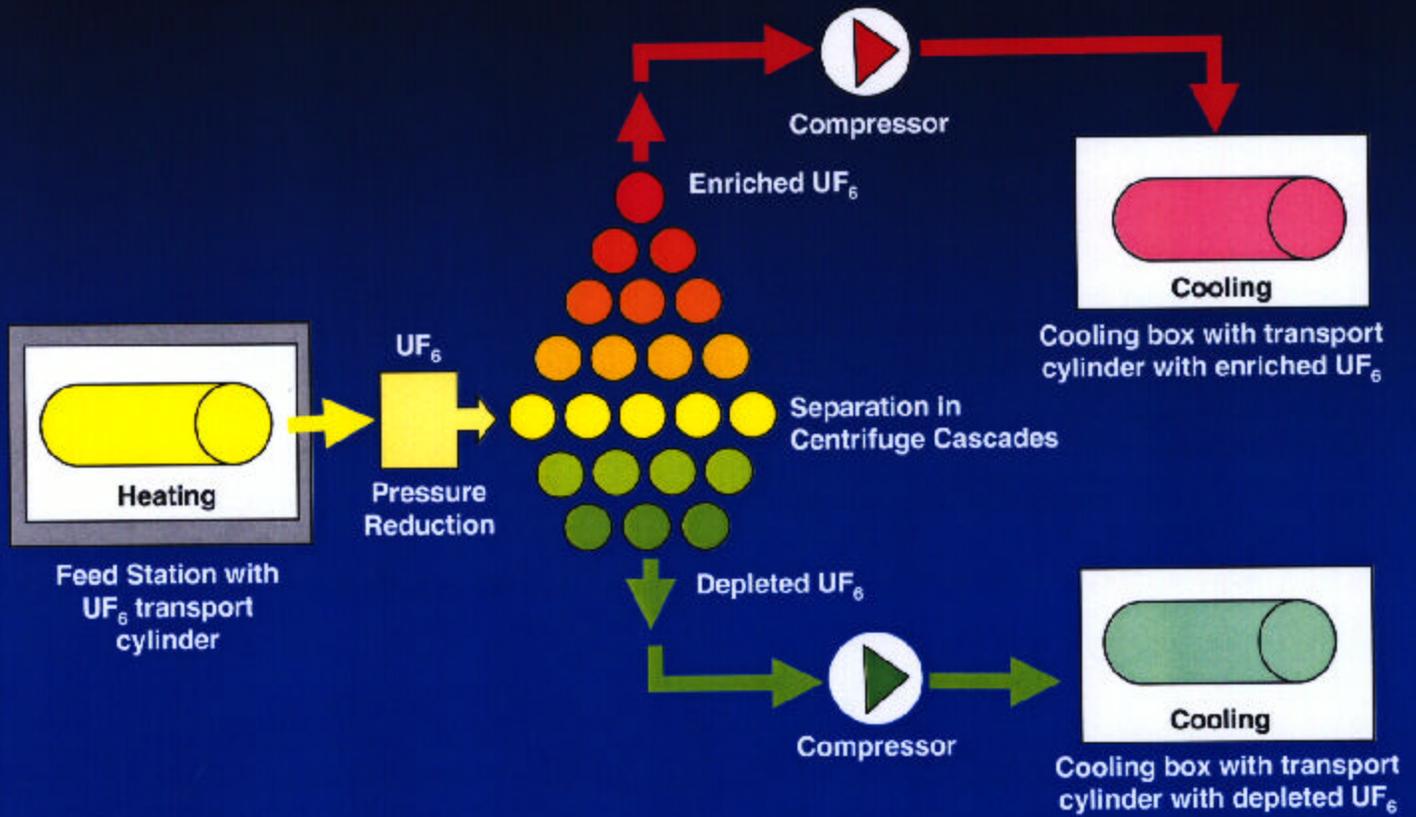
Uranium Enrichment Site Capenhurst - 2.3 million SWU / yr



Uranium Enrichment Site Almelo - 1.6 million SWU / yr



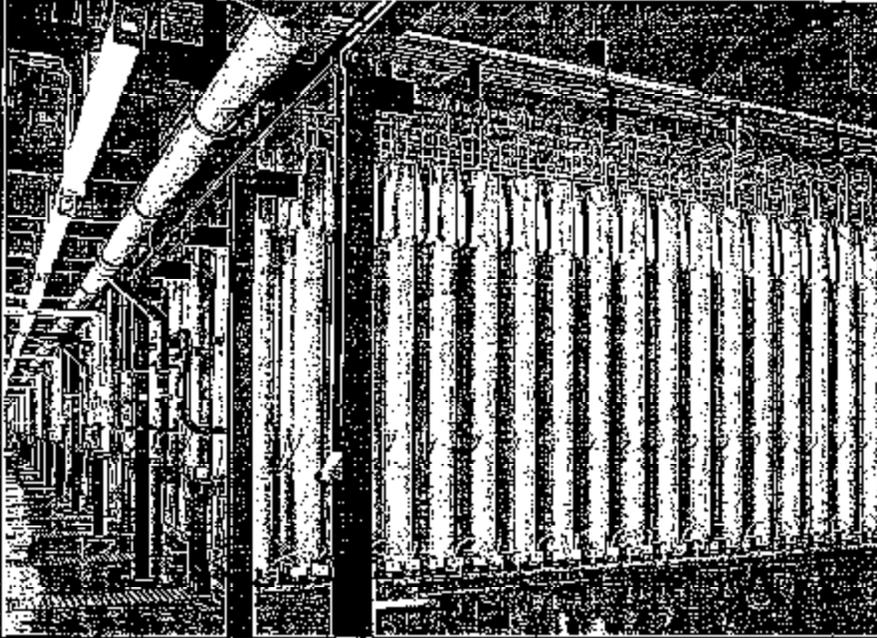
Flow of UF_6 through the Enrichment Plant



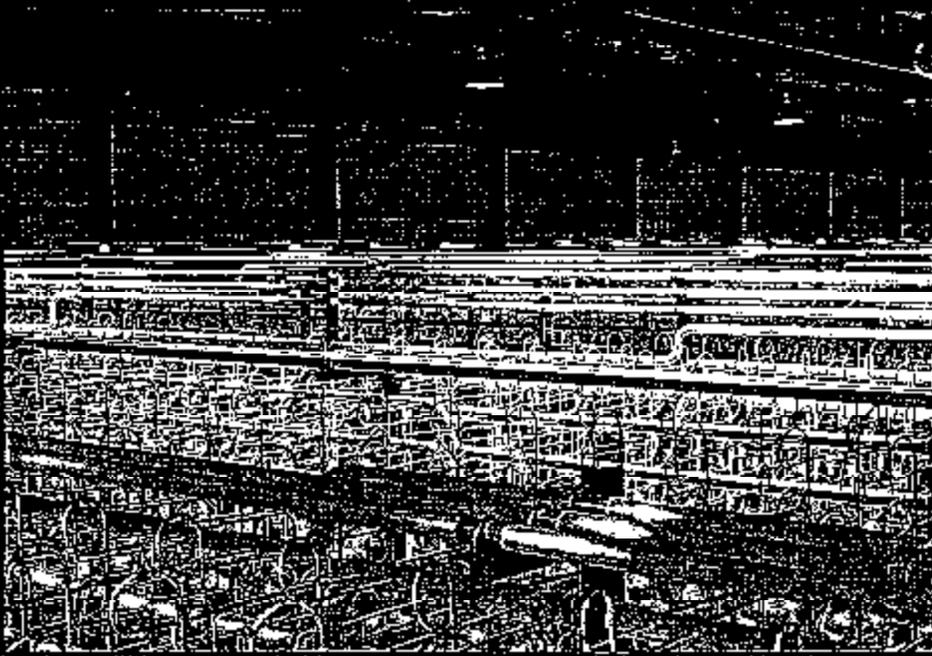
SP5 Layout

Cascade Hall 4	Process Service Corridor	Cascade Hall 3	Centrifuge Assembly	Cascade Hall 1	Process Service Corridor	Cascade Hall 2
UTILITIES						
F.P.T. UF ₆ Area	F.P.T. UF ₆ Area	Entrance Control Room	F.P.T. UF ₆ Area	F.P.T. UF ₆ Area		

TC12 Cascade



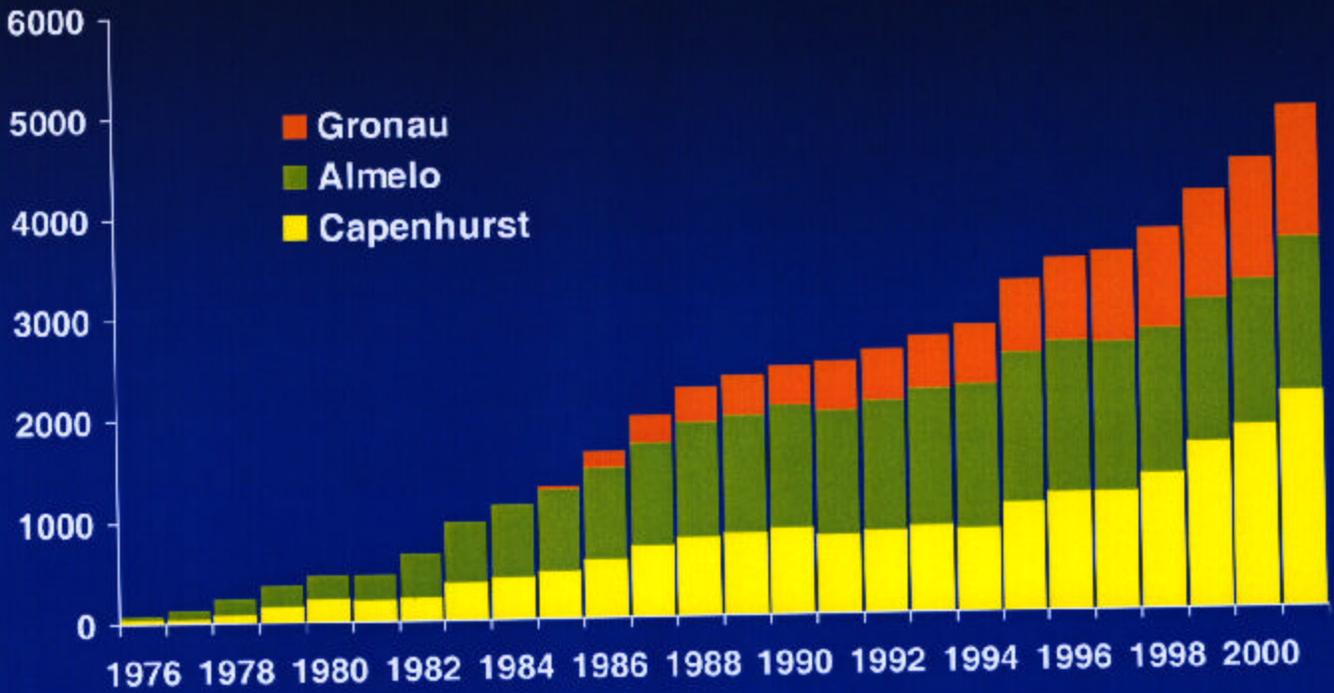
Typical Cascade Pipework



Urenco Production

1976 - 2001

t SWU / yr

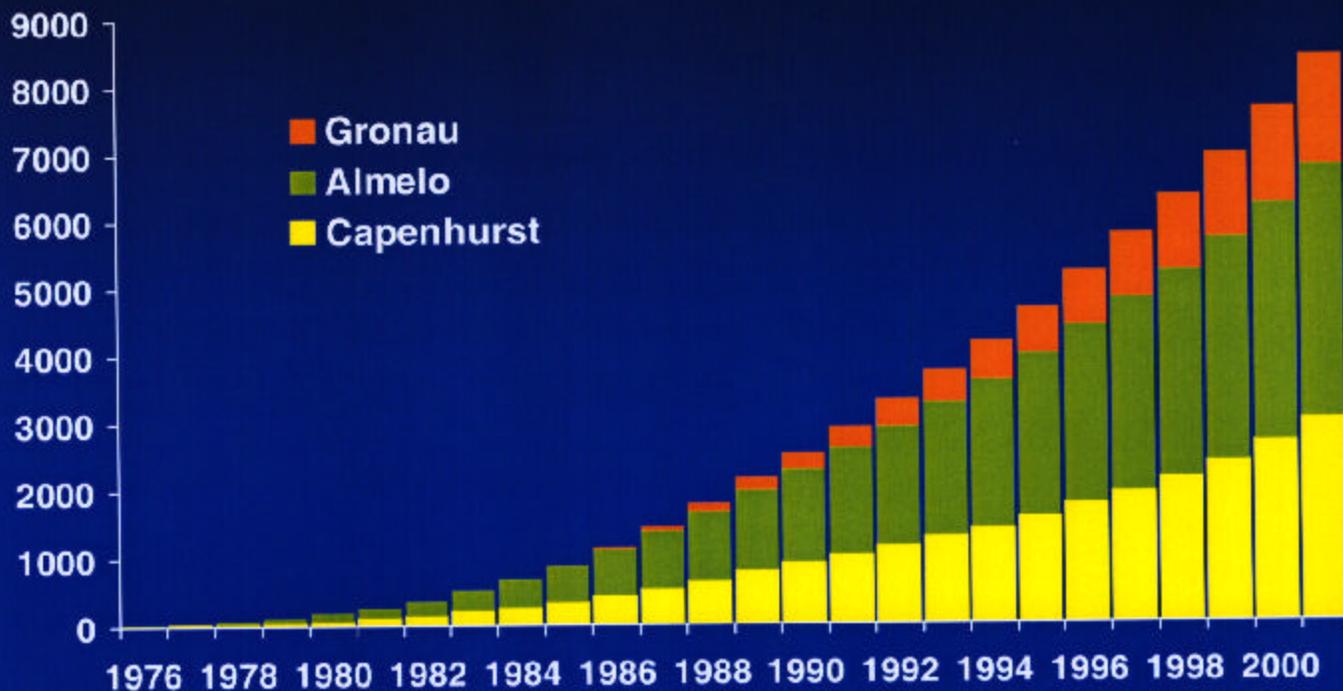


ureenco

Cumulative Number of Feed Cylinders Handled

1976 - 2001

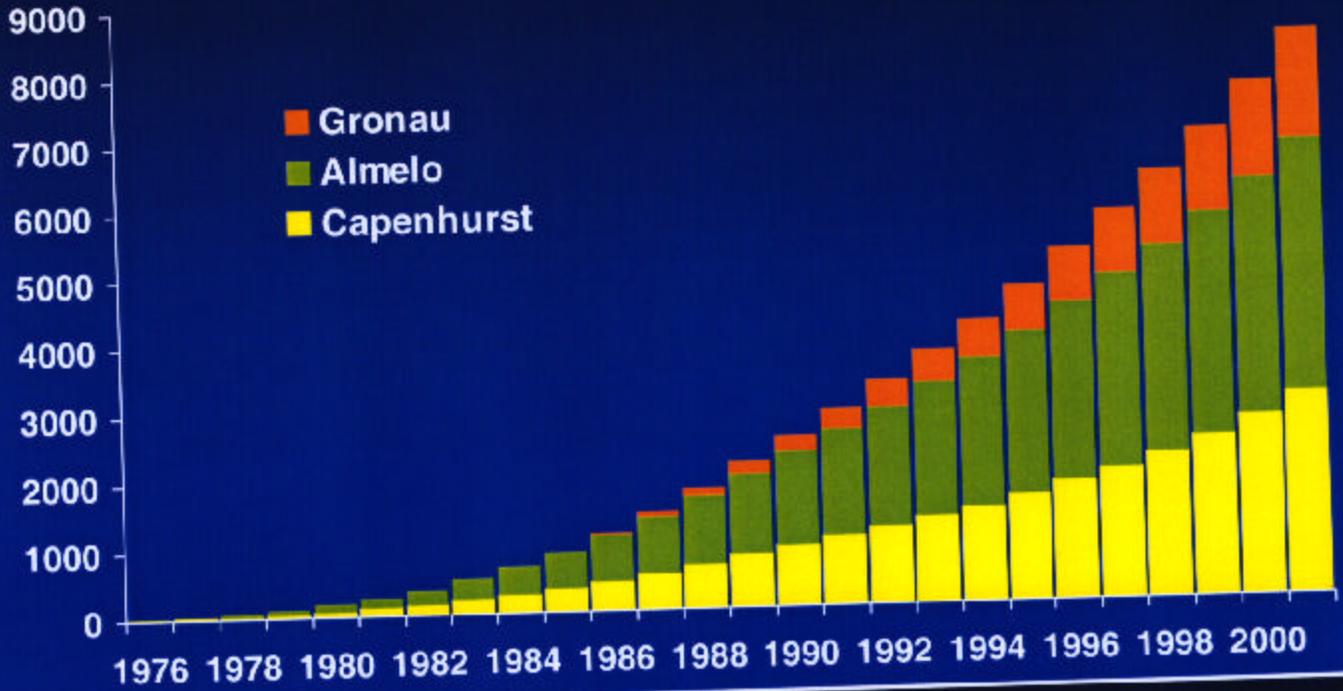
Number of Cylinders



Cumulative Number of Product Cylinders Filled

1976 - 2001

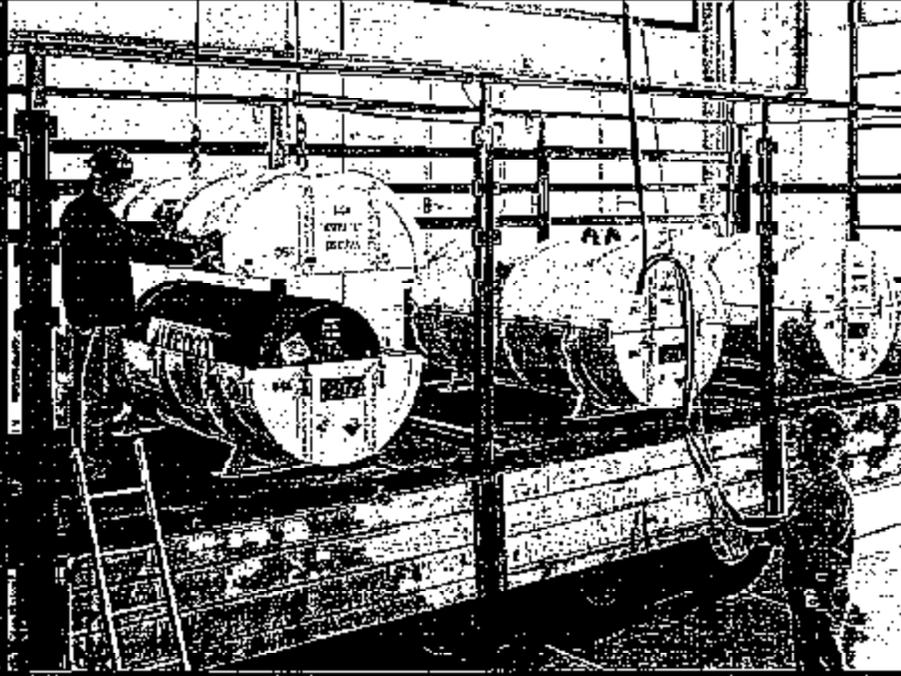
Number of Cylinders



Urenco

COJ

Transport of Product



Events / Incidents with the Process Medium

Types of Incidents Possible

- Criticality
 - No occurrences
- Worker Overexposure of Radiation
 - No occurrences
- Release of UF_6
 - 13 releases of small quantities of UF_6

Events / Incidents with the Process Medium (cont.)

Causes of Releases

- Bulk of releases caused during period 1972 – 1984 by faults in liquid and super-atmospheric pressure UF_6 systems
- Seat leaks on valves, e.g. cylinder valves

Events / Incidents with the Process Medium (cont.)

Consequences of Releases

- **Effect on Public**
 - None
- **Effect on Employees**
 - 14 employees received reportable 'uranium-in-urine' quantities. After 2 days levels were below detection limits
- **Effect on Environment**
 - 2 cases of gaseous discharges exceeding limits (0.8 grams and 1.1 grams of uranium)
 - No effect on environment

Events / Incidents with the Process Medium (cont.)

In over 30 years of operation URENCO has had no incidents of significant consequence

- **Lessons learned from the above minor incidents have been incorporated into plant design and operation**

Lessons Learned

- **Implemented process for continuous development of employee skills**
- **Implemented continuous training on procedures**
- **Implemented continuous improvement of procedures**
- **Design of operating plants reviewed**
- **Improvements fed into next generation of plant design**

Conclusion

- **Urenco experience will be reflected in the design and operation of the LES-2 plant**