April 5, 2002

MEMORANDUM TO: Eric J. Leeds, Chief
Special Projects Branch
Division of Fuel Cycle Safety
and Safeguards

THRU: Joseph G. Giitter, Chief
Enrichment Section **/RA/**
Special Projects Branch, FCSS

FROM: Timothy C. Johnson **/RA/**
Senior Mechanical Systems Engineer
Enrichment Section
Special Projects Branch, FCSS

SUBJECT: MARCH 19, 2002, MEETING SUMMARY: LOUISIANA ENERGY SERVICES PRE-APPLICATION MEETING

On March 19, 2002, U.S. Nuclear Regulatory Commission (NRC) staff met with staff from Louisiana Energy Services (LES) to discuss LES plans for submitting a gas centrifuge enrichment facility license application and topics for future pre-application reviews. I am attaching the meeting summary for your use. This summary contains no proprietary or classified information.

Docket No: 70-3103

Attachment: Louisiana Energy Services Pre-Application Meeting Summary

cc: William Szymanski/DOE

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Attachment: Louisiana Energy Services Pre-Application Meeting Summary

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G:\SPB\TCJ\URENCOGCMTGSUM3-19.WPD *SEE PREVIOUS CONCURRENCE

OFC	SPB*		SPB*	2E	SPB*	
NAME	TCJohnson:dw		DHoadley		JGiitter	
DATE	3 / 26 /02		4 / 04 /02		4 / 05 /02	

C = COVER **E = COVER & ENCLOSURE** **N = NO COPY**
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Louisiana Energy Services Pre-Application Meeting

Date: March 19, 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 its plans to submit a license application for a gas centrifuge enrichment facility and topics for future pre-application review meetings. The meeting agenda is provided in Attachment 2. Meeting handouts are provided in Attachment 3.

Discussion:

Following introduction of individuals attending the meeting, LES staff indicated that there was a market need for low cost, reliable enrichment capacity within the U.S. Based on LES experience in using gas centrifuge enrichment in Europe, it believes it is well-placed to provide its most advanced centrifuge technology. It, therefore, wants to license and construct at least a 3-million Separative Work Unit (SWU) plant and begin production in 2007. The plant would consist of six 500,000 SWU cascades.

The LES partnership is made up of limited and general partners currently consisting of Urenco, Exelon, Duke Power, Louisiana Power and Light, and Fluor Daniel. The partnership intends to use Urenco gas centrifuge technology that is currently operating at three plants in The Netherlands, United Kingdom, and Germany. Urenco currently has a capacity of about 5-million SWU (about 15 percent of the world enrichment market) and provides enrichment services in Western Europe, the U.S., and Asia. LES staff indicated Urenco has a large future order book, and in 2001 its revenues were approximately $423 million.

LES staff indicated that it would use the sixth-generation Urenco gas centrifuge system that is of all composite construction. This system would provide high reliability, low energy consumption, low investment costs, and high efficiency. The operating philosophy would be to operate each gas centrifuge machine without maintenance. Upon failure it would be permanently isolated from the cascade.

LES staff said that to go forward with the project, LES would need an assured licensing process that is short and predictable. It would also need customer commitment, access to a US depleted uranium tails disposition route, and a site on an existing nuclear facility site. LES staff indicated that the site could be any nuclear facility site and would not be restricted to any specific facility type. The siting process is due to begin shortly with a goal of site selection in the second quarter of calendar year (CY) 2002. LES staff plans to submit to the NRC a license application and an environmental report in the fourth quarter of CY2002. LES staff projected license approval in the second or third quarter of CY2004 with construction beginning in third or fourth quarter CY2004. The first 500,000 SWU cascade is planned to be on-line by the end of CY2006. Full capacity is projected to be in 2010 or 2011 depending on market demand.

LES staff then discussed their plans for the enrichment plant. They indicated that the facility would have a feed station, the cascade section, enriched product and tails withdrawal stations, and a sampling station. The feed and withdrawal operations would take place at sub-atmospheric conditions to maintain the UF6 in only gaseous and solid forms. In response to customer needs, sampling would involve heating UF6 containers to a liquid form. However, the sampling station would be isolated from the production plant and no transport or lifting of UF6 cylinders with liquids would be permitted. Rail transporters in the feed and withdrawal stations are used so that no craning is required.

Prior to introducing UF6 into the cascade, the feed would be processed in purification stations to remove air and light gases with sublimers and chemical trapping systems.

The cascades are designed to produce a single product assay at any one time. Customer specifications are achieved directly from the cascade or by blending. The plant is designed so that the centrifuges and cascade piping are located in a cascade hall where no routine access is required. Cascade controls and services are provided in a process service corridor. Centrifuges would be assembled on-site from kits received from Europe.

LES staff provided the following operational information for a 3-million SWU plant:

1. 8,600 tonnes of feed required per year;
2. 7,800 tonnes of depleted uranium produced per year;
3. 800 tonnes of enriched product produced per year;
4. plant would take delivery of 700 48Y feed cylinders per year;
5. plant would dispatch 350 30B cylinders per year;
6. plant would require a dual 18 MVA electrical supply; and
7. plant would produce 12 tonnes of unprocessed low-level waste per year.

LES staff discussed the key differences between the new enrichment plant and the original LES plant proposed for the Homer, Louisiana, site. The following are some of the major differences:

Site Selection: The site selection criteria is principally the same and will address low seismic hazard, no previous contamination, moderate climate, and redundant high quality electrical supplies. Unlike the Homer site, LES intends to construct the new plant on an existing nuclear site. The sites could include existing fuel cycle facility sites or nuclear power plant sites.

Plant Specifications: The proposed plant will have a total capacity of 3 million SWU versus 1.5 million SWU for the Homer plant and the assay level will be 6 percent enrichment versus 5 percent for the Homer plant. In the new plant, blending and sampling will be performed in a separate building from the rest of the enrichment operations.

Feed System: The proposed plant will use a subatmospheric sublimation process rather than heating UF6 to a liquid for the feed system. The feed purification desublimer capacity will be reduced to 50 kg from 500 kg in the Homer plant and temperature will be reduced from 50 C to ambient. All Freon materials will be eliminated from heating and cooling systems. These new processes increase operational safety.

Centrifuges: The same centrifuge type will be used in the new plant as was proposed in the Homer plant. The number of machines per cascade will be greater and the number of cascades per assay unit will be reduced.

Withdrawal: The proposed plant will eliminate the second pumping stage with withdrawal performed at -25 C. Cascades will now share low pressure pumps and the product vent desublimer will have a reduced capacity and use no Freon coolant.

Gaseous Effluents: A system similar to the Homer plant will be used.

Criticality: A criticality alarm system, not required in the Homer plant, will be used.

Controls: A state-of-the-art control system will be used. This is a significant upgrade from the Homer design.

LES staff indicated that the applicant will be Louisiana Energy Services and a U.S. organization is being formed. The current licensing interface with the applicant will be Rod Krich from Exelon. LES staff stated that it plans to use the most recent 10 CFR Part 70 guidance for preparing the application and the required integrated safety assessment. LES staff indicated that a new standard review plan for a uranium enrichment plant would not be needed. In the application, LES will identify unchanged information from the previously accepted Homer plant.

LES staff identified the following areas for pre-application discussions:

1. General policy issues including environmental review criteria;
2. Codes and standards;
3. Security;
4. Restricted data;
5. Control systems;
6. Conduct of operations;
7. Site characterization; and
8. Quality assurance.

Action Items:

None

Attachments: 1. Attendee list
2. Meeting agenda
3. Meeting handouts

Urenco Pre-Application Meeting
Date: March 19, 2002

NAME	AFFILIATION	PHONE
Tim Johnson	NRC	301-415-7299
CHRIS ANDREWS	URENCO	44-151-473-4067
DUNCAN WILD	URENCO	44-151-473-4337
PAT UPSON	URENCO	44 1628 402234
Kim Kitch	Exelon	630-657-2513
Jim Curtiss	Winston & Straw	202-371-5751
JOE DISTEFANO	LES	410-867-4444
ALEX MURRAY	US NRC	301-415-7854
[illegible]	NRC/NMSS	301-415-1644
THOMAS MARTIN	NRC (SECURITY)	301 415 8080
[illegible]	NRC	301 415 6013
David Brown	NRC	301 415-5257
JOSEPH GLITTER	NRC	301-415-7485
David Culp	Duke Energy Corp	(704) 382 8833
Lynn Silvious	NRC SECURITY	(301) 415-2214
Wayne Burnside	NRC Security	301-415-2211
Margaret Chatterton	NRC/NMSS/FCSS/FSPB	301-415-7906

Urenco Pre-Application Meeting
Date: March 19, 2002

NAME	AFFILIATION	PHONE
FRED BURROWS	NRC	301-415-8110
Harry Felsher	NRC	301-415-5521
Bill Reamer	NRC/FCSS	301-415-5848
Erich Kraska	self	703-242-8067
Charlotte Abrams	NRC	301 415 7293
Jennifer Euchner	NRC	301-415-3877
Joseph Bader	SAIC	202-237-2423
MICHAEL KNAPIK	McGRAW-HILL	202-383-2167
JOSEPH PRICE	SAIC	301-353-8215
Jim Hammelman	SAIC	540 341-8002
Bill Szymanski	DOE	202 586-9086
John Guselle	Cameco	306 956 6224
Mario Robles, Jr.	USEC	301-564-3408
TRENT WERTZ	USEC	301-564-3324
Ken Petersen	Exelon	630-657-2153
Larry Brown	DOE/NE	202 586 0843
ANITA BLUMENTHAL	Nuclear Today	202-739-7902

Urenco Pre-Application Meeting
Date: March 19, 2002

NAME	AFFILIATION	PHONE
Mike Brown	Entergy Nuclear, LP&L	601-368-5678
Eric Leeds	NRC	301-415-6334
MARIA E. Lopez-Ofin	USNRC OCM/NSD	415-8420

Urenco Pre-Application Meeting Agenda
March 19, 2002

1:00 PM	Purpose/Introductions (TCJohnson)
1:15 PM	General Description/Process (Urenco)
1:45 PM	Differences Between Proposed Design and Louisiana Energy Services Design (Urenco)
2:00 PM	Gas Centrifuge Safety Issues (Urenco)
3:00 PM	General Approach to Licensing (Urenco)
3:30 PM	Future Issues and Topics for Pre-Application Review (Urenco)
4:00 PM	Prioritization of Meeting Topics and Schedule of Pre-Application Review Meetings (Urenco, NRC)

Louisiana Energy Services (LES)
Presentation to NRC

On March 19, 2002

in

Rockville, Maryland

Agenda

1.15	Introduction to Urenco / LES	(P C Upson, Urenco)
1.45	General Description of the Plant / Processes	(D L Wild, Urenco)
2.15	Differences between Proposed Design and Original Louisiana Energy Services Design	(C A Andrews, Urenco)
2.45	General Approach to Licensing	(R Krich, Exelon)
3.15	Future Issues and Topics for Pre-Application Review	(R Krich, Exelon)
3.45	Prioritizations of Meeting Topics and Schedule of Pre-Application Review Meetings	(R Krich, Exelon)

Participants

Pat Upson (Managing Director, Technical, Urenco Ltd.)

Duncan Wild (Head of Urenco Project Division, UPD)

Chris Andrews (Design & Licensing Manager, UPD)

Rod Krich (Interim Licensing Consultant to LES, Exelon)

Introduction : Motivation & Aims

Motivation - **market requirement and strategic need for US based capacity**

- **LES wish to supply US market**

Aims

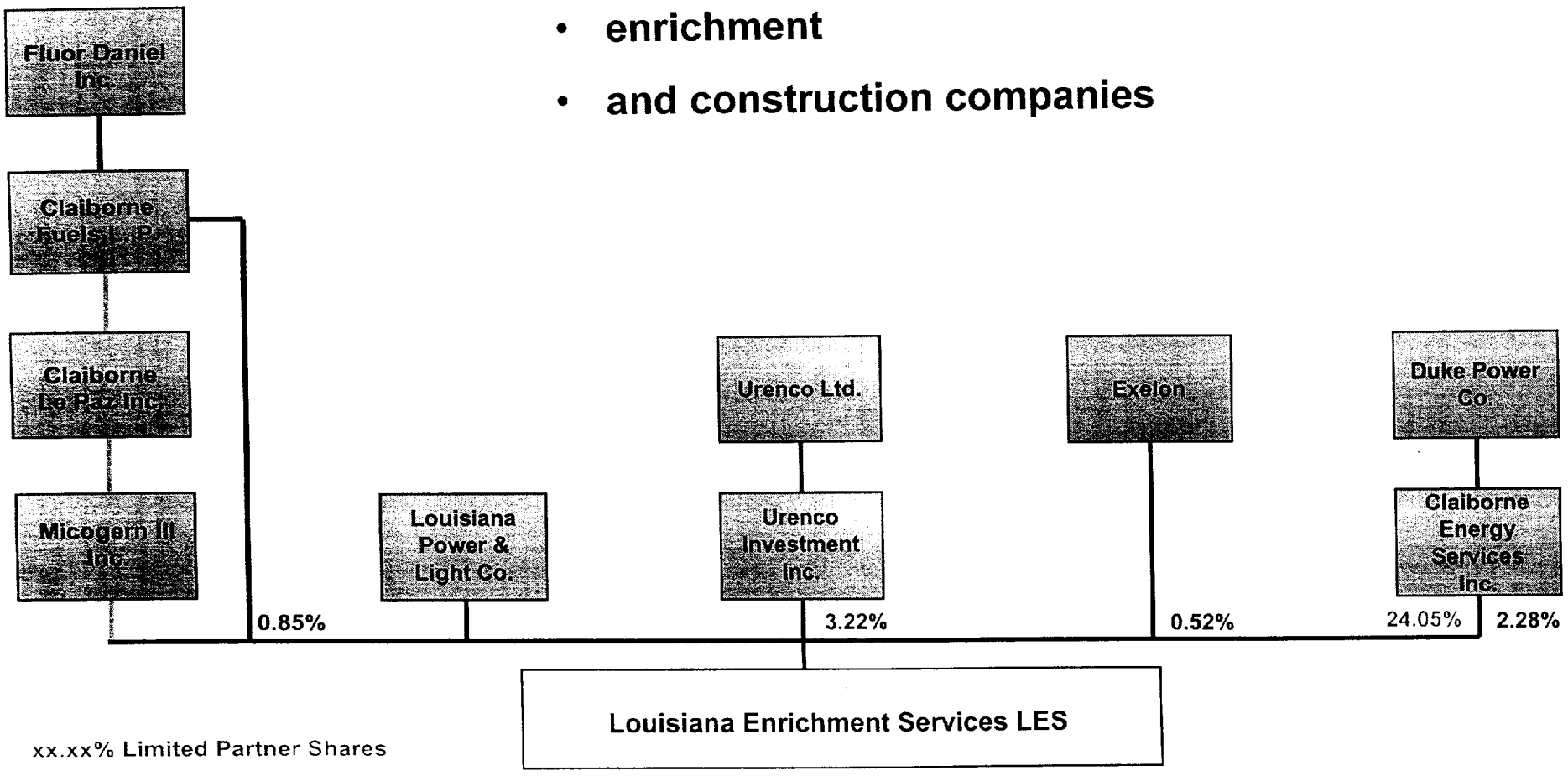
- **to introduce latest, most cost efficient and reliable Urenco technology into the US**
- **to start producing in 2007**
- **to install production capacity of at least 3,000,000 SWU/yr to meet market demand**
- **to react to market needs by adapting the installation programme as required**

LES

Who are LES ?

Partnership of

- **utilities,**
- **enrichment**
- **and construction companies**



xx.xx% Limited Partner Shares

xx.xx% General Partner Shares

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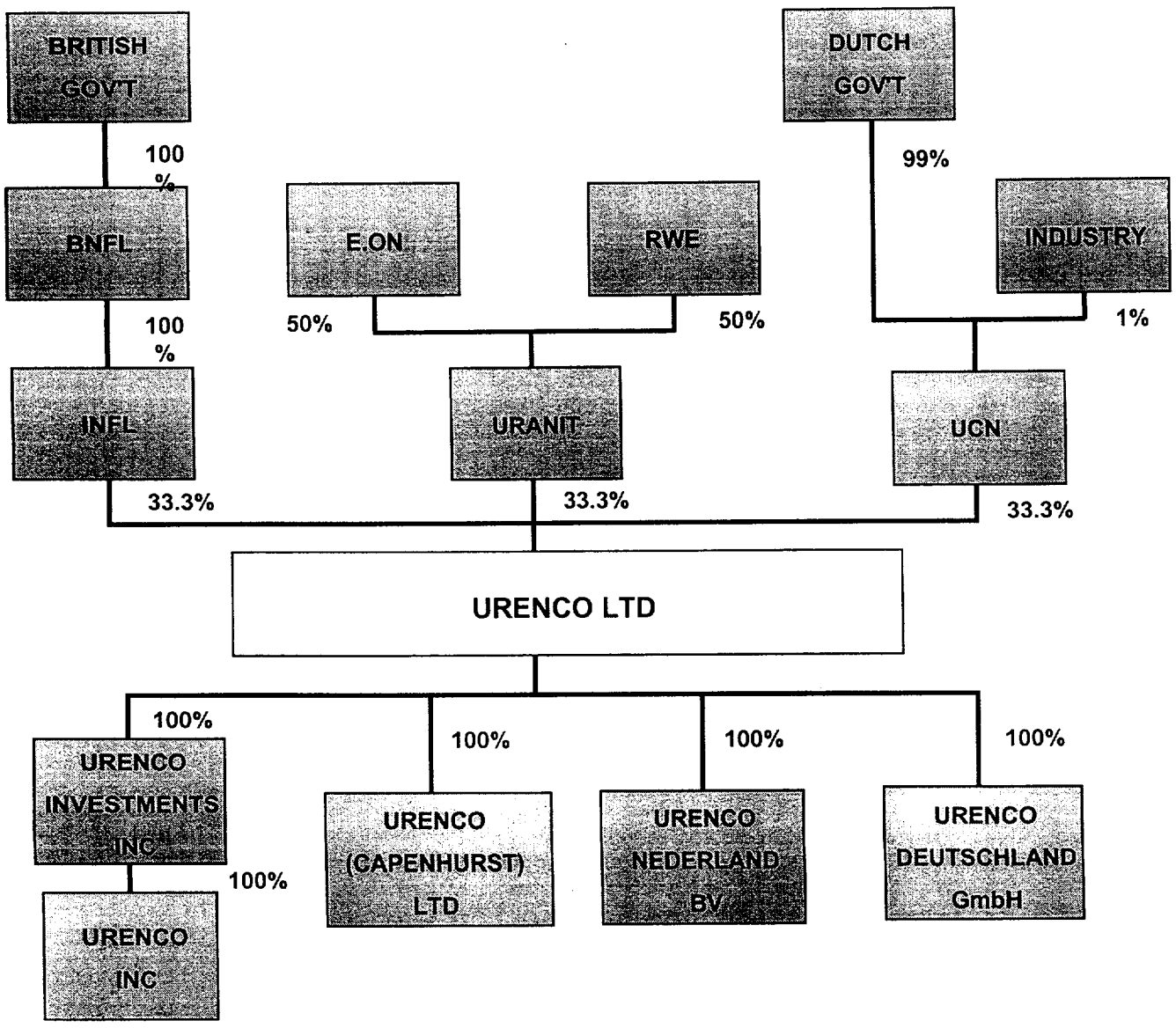
The Urenco Structure



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Urenco : Facts and Figures

- **Formed by the Treaty of Almelo in 1970**
- **Enrichment plants in Germany, Holland and the UK**
- **Government shareholders in Holland and the UK, leading industry shareholders in Germany**
- **World leaders in the centrifuge enrichment process**
- **Steady rise in production from 1976**
- **Approaching 15% world market share**
- **Significant supplier to Western Europe, US and Asia**
- **Ongoing plant installation programme, construction of 3 million SWU new plant since 1995**
- **Revenues of M€ 470 (≈ $ 423M) in 2001**
- **Large future order book**

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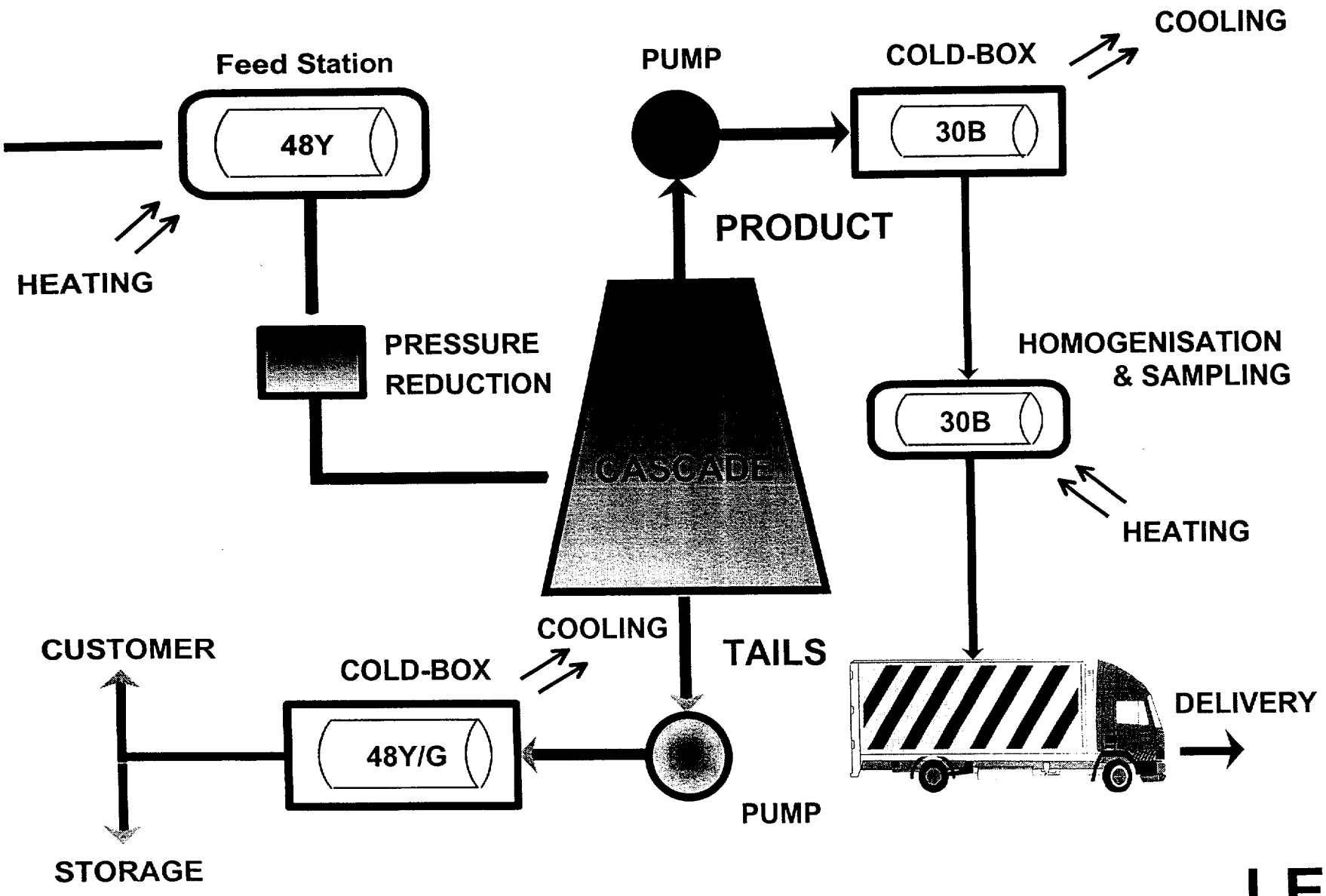
Historical Survey of Centrifuge Technology

1945	**First gas centrifuges developed**
1966	**First centrifuge prototypes developed**
1970	**Almelo Treaty**
1972	**First pilot cascades in the UK and Netherlands on line**
1976	**First commercial cascade on line**
1981	**First cascades with improved machines**
1986	**Cascades with more improved machines**
1988	**First cascade with carbon fibre reinforced plastic rotor**

Centrifuge Production Flow Diagram



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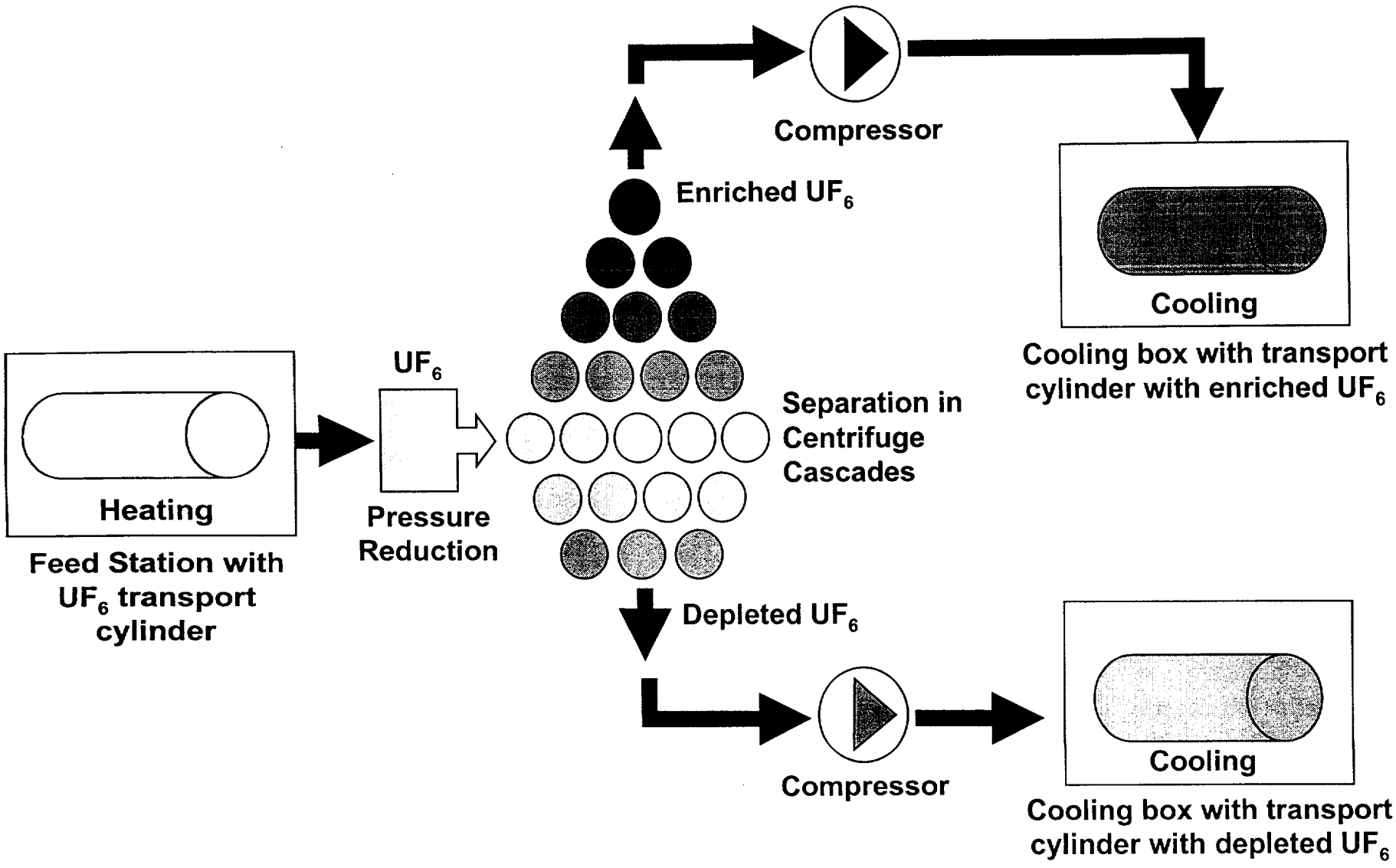
Flow of UF_6 through the Enrichment Plant



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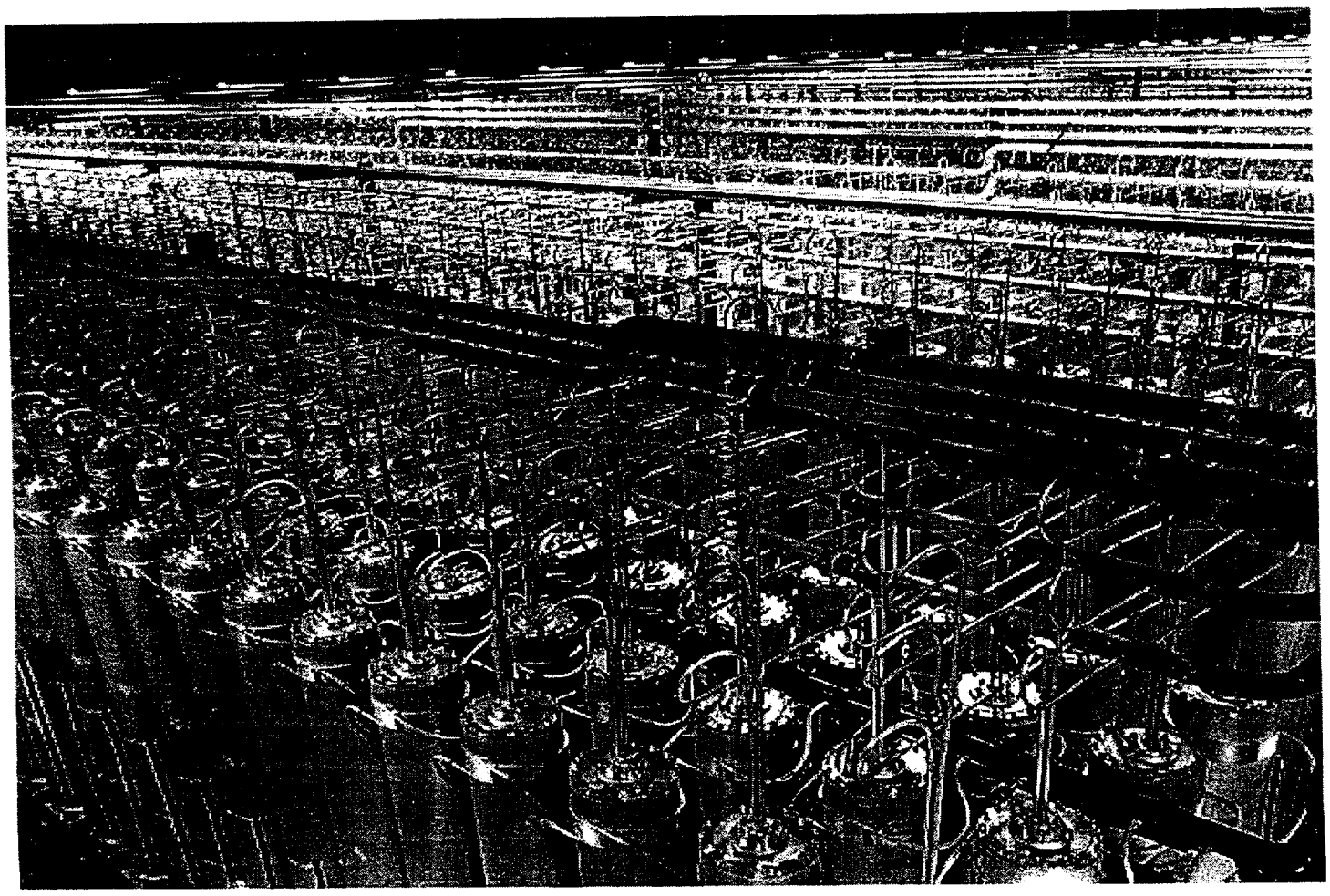
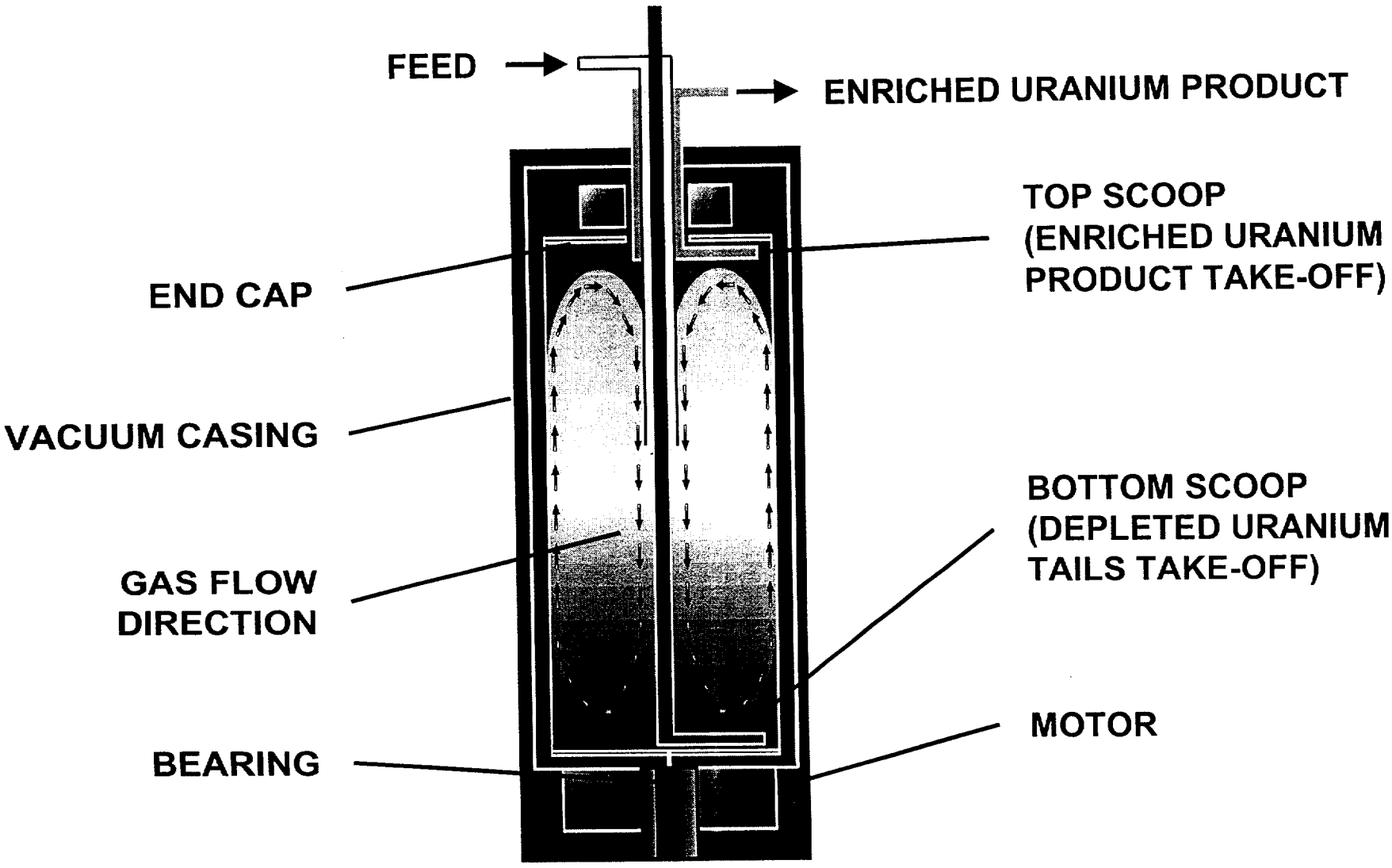
A Centrifuge Cascade



How The Ultracentrifuge Works



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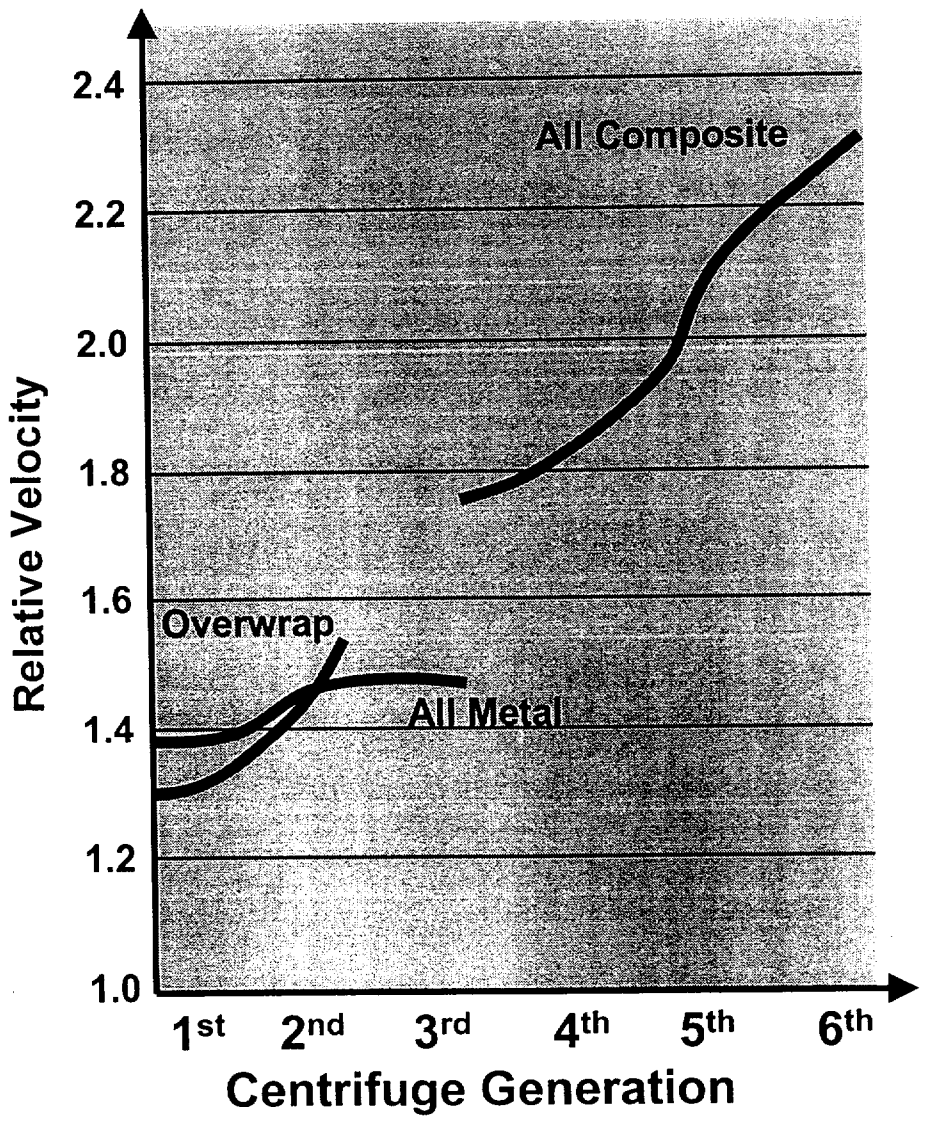
Urenco's Centrifuge Design Philosophy

- **No maintenance or service**
- **Maximum reliability**
- **Low energy consumption**
- **Low investment costs**
- **High efficiency**



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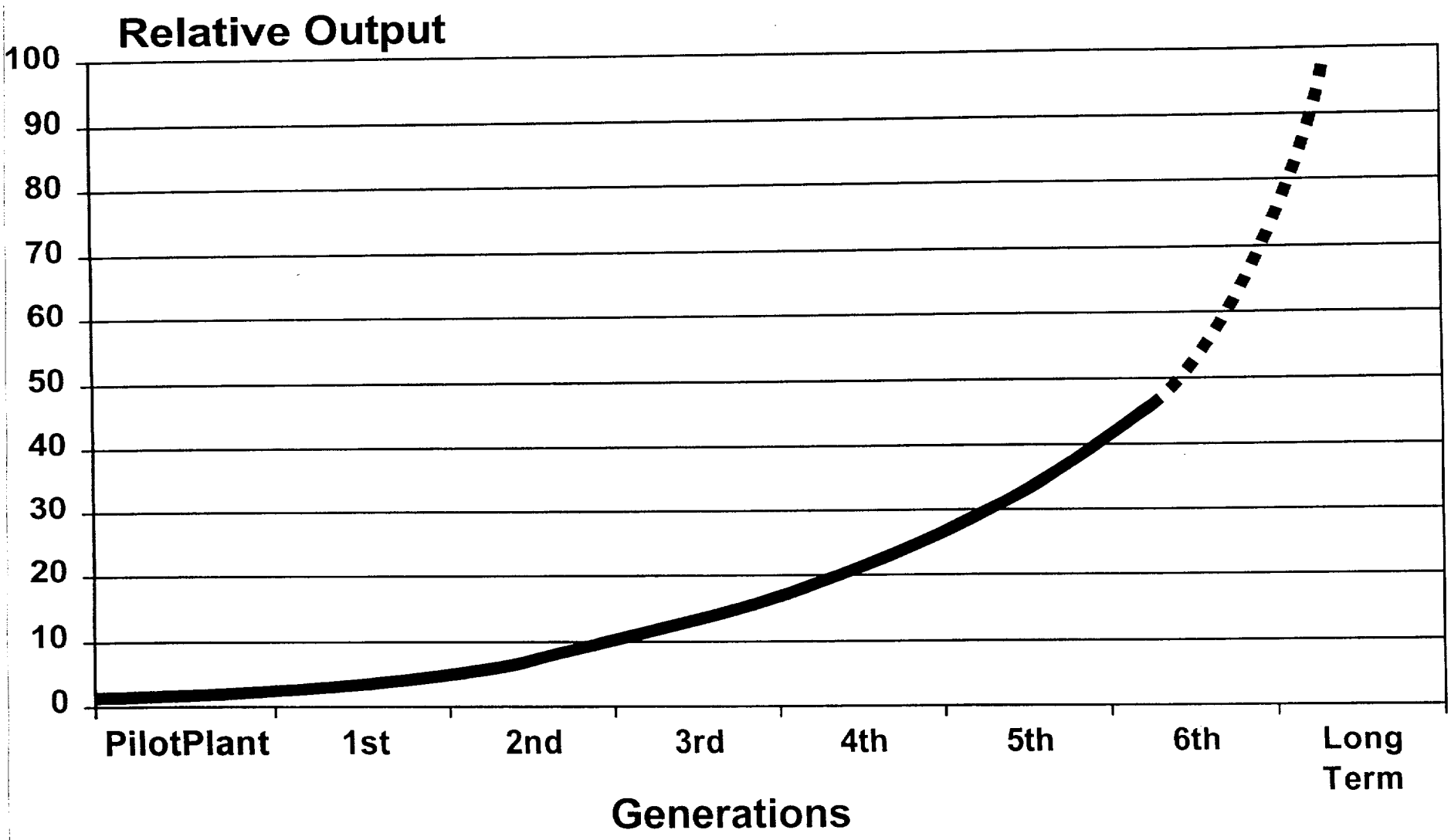
Urenco Centrifuge Development



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Urenco Centrifuge Development : Latest Design

Early Design

Latest Design

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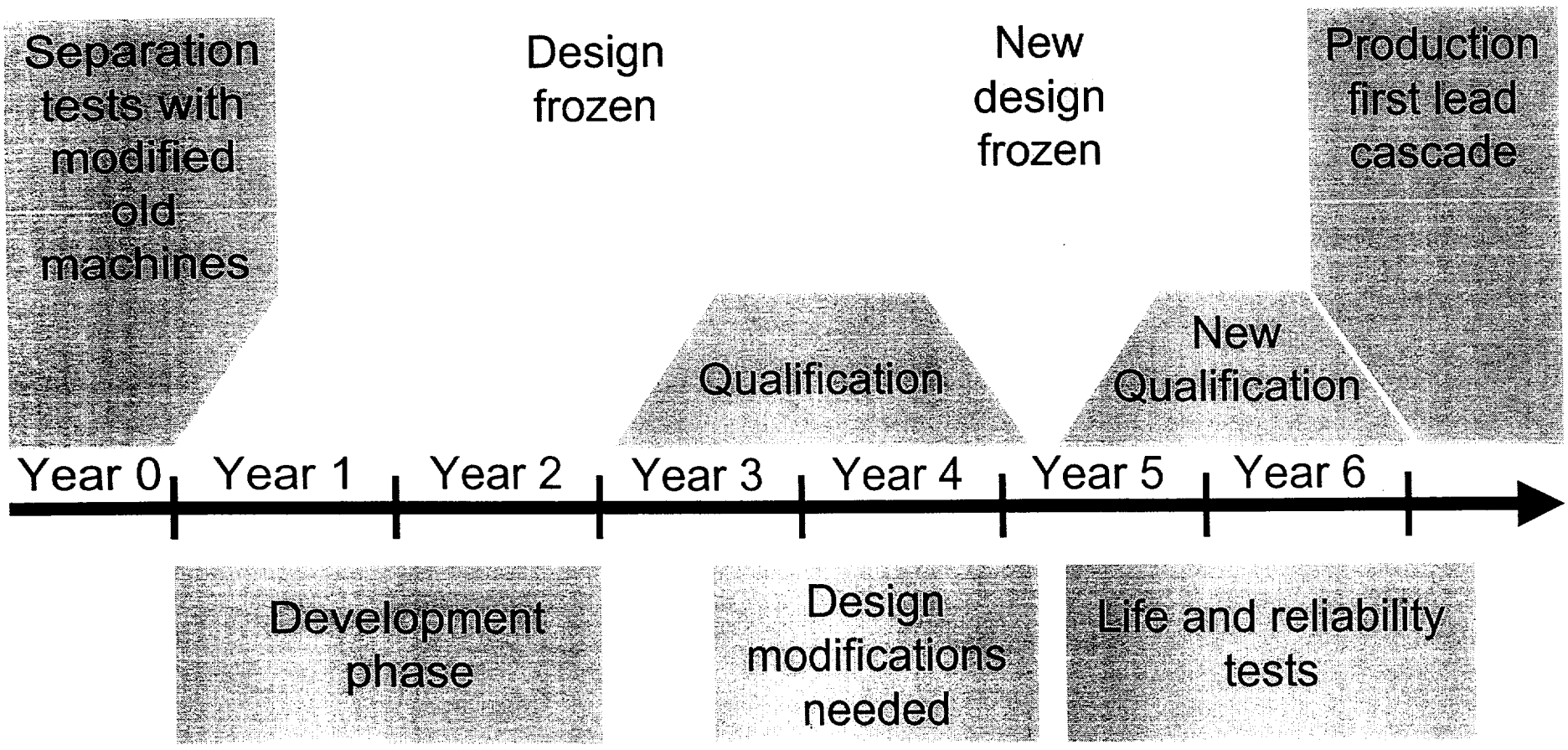
Typical Development Programme of a New Machine



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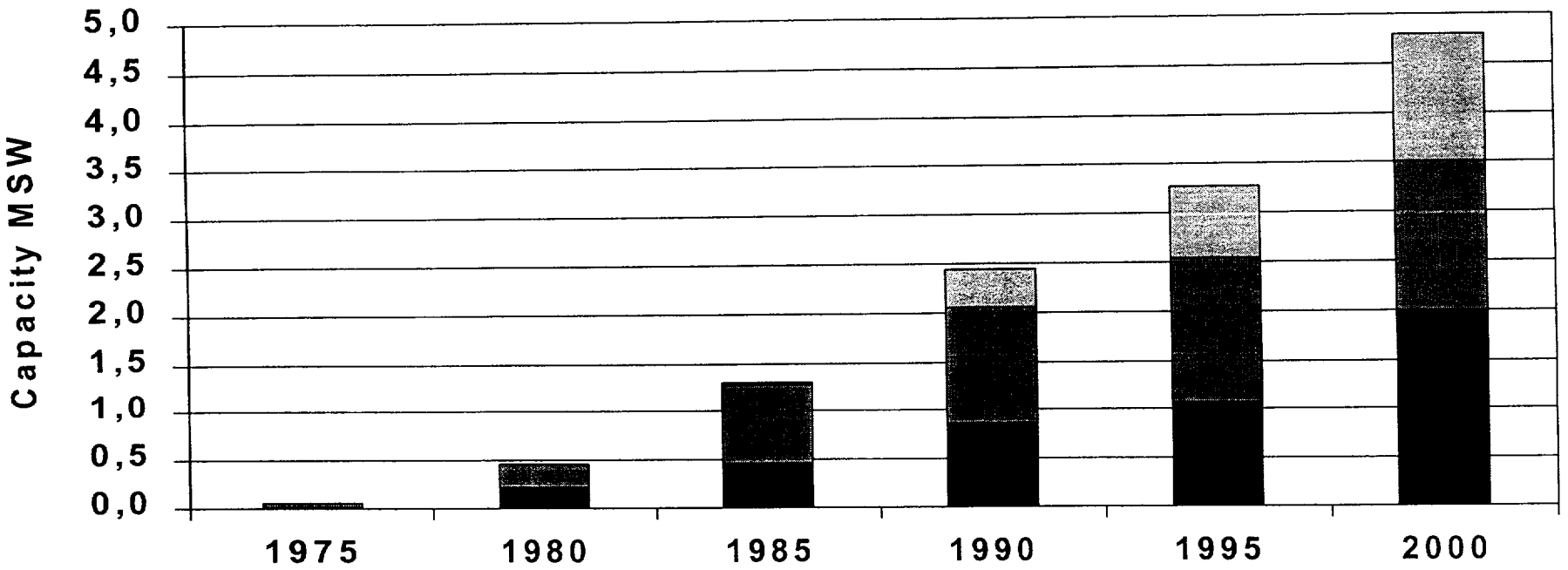
Urenco Installed Centrifuge Capacity



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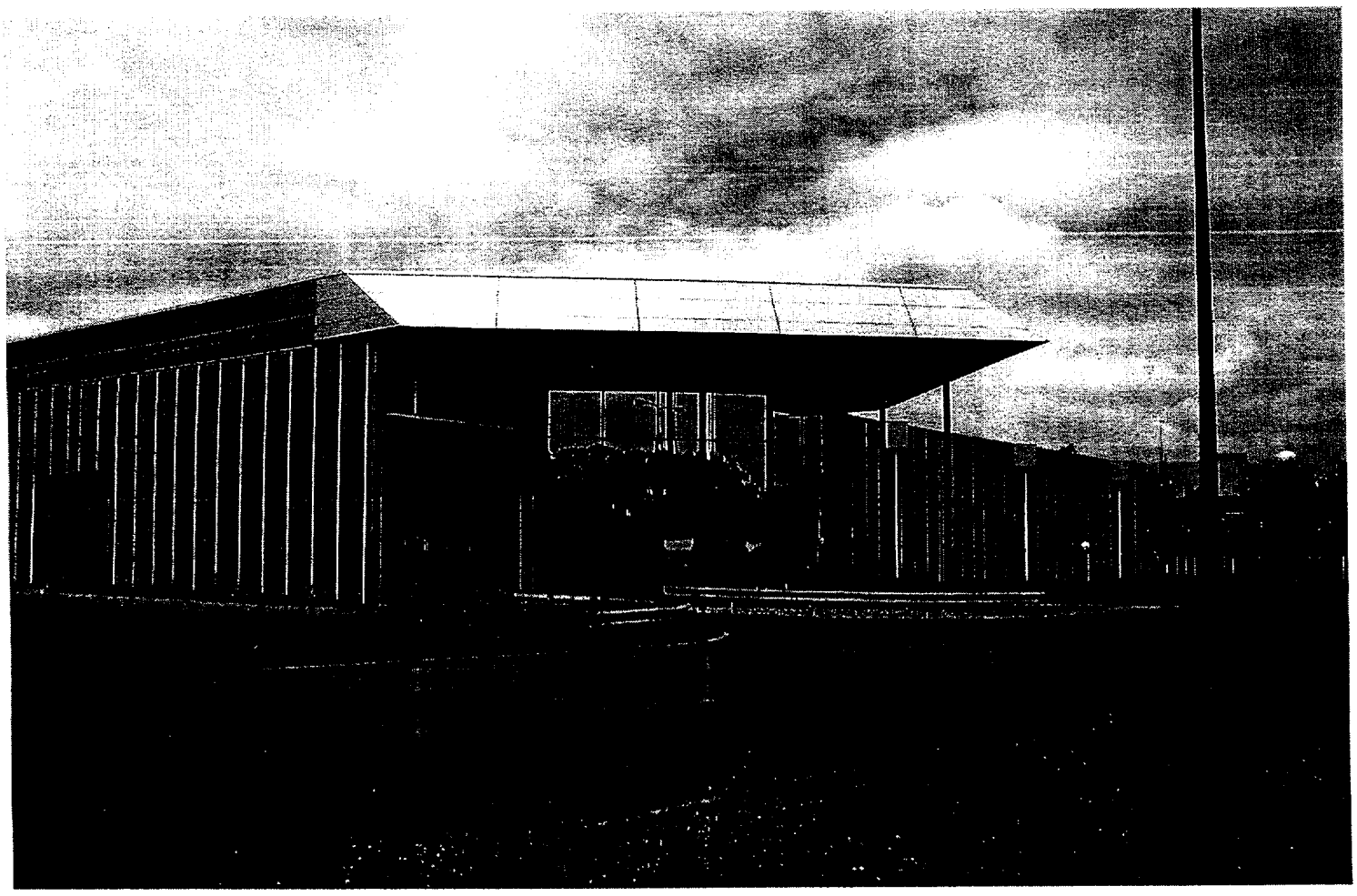
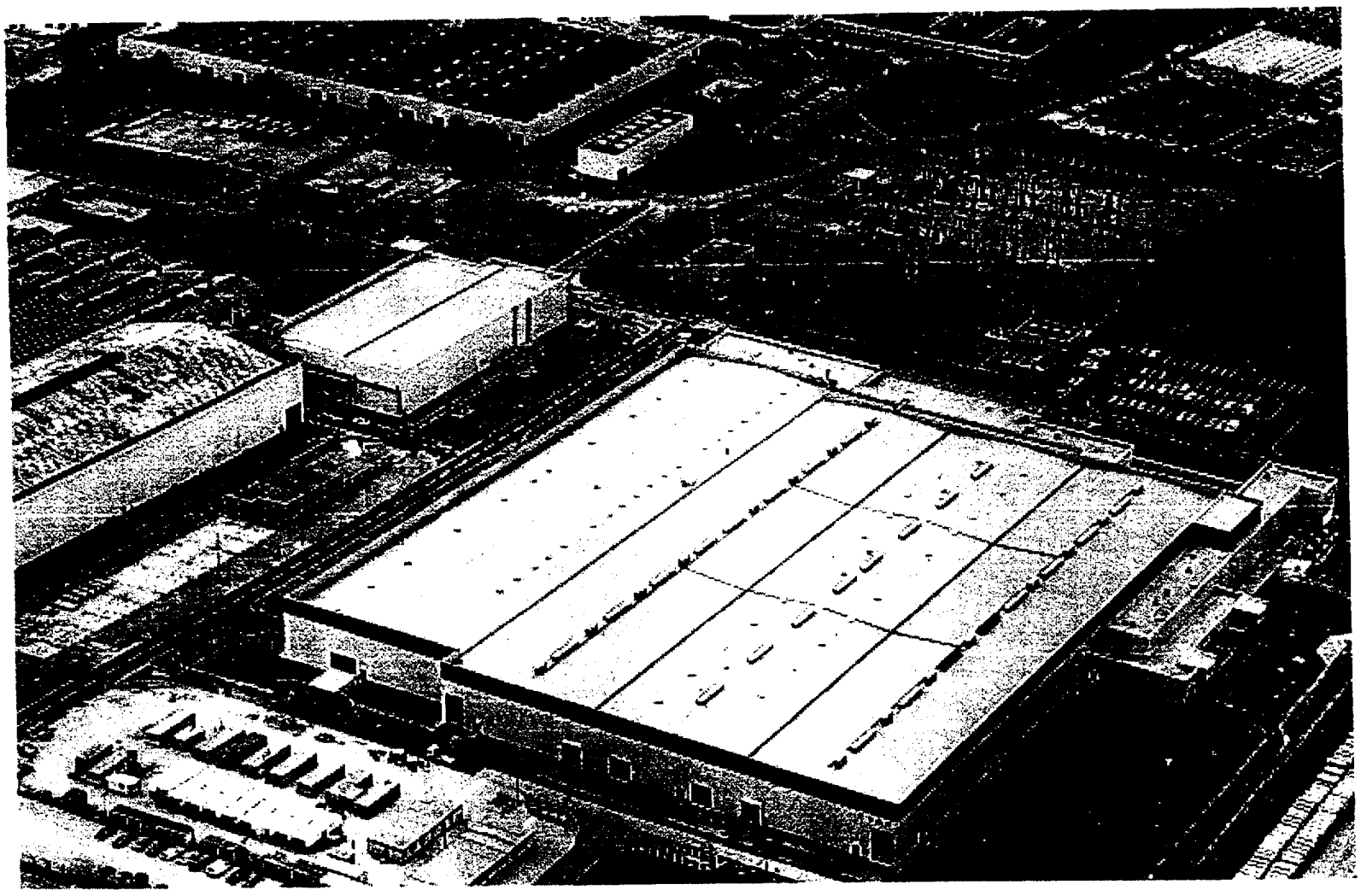
SP5 Building Almelo



LES

E23 Building Capenhurst



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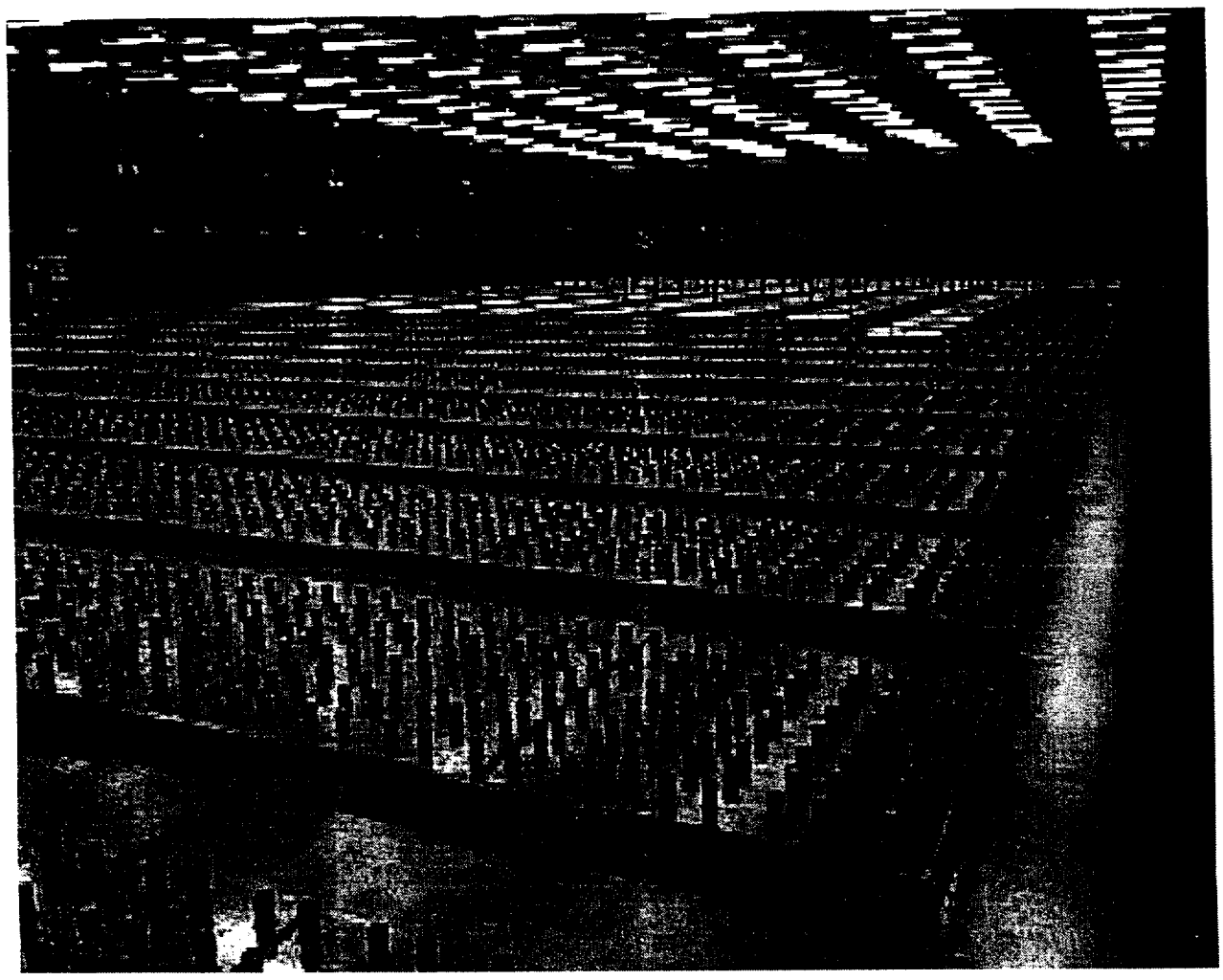
Cascade Build Up



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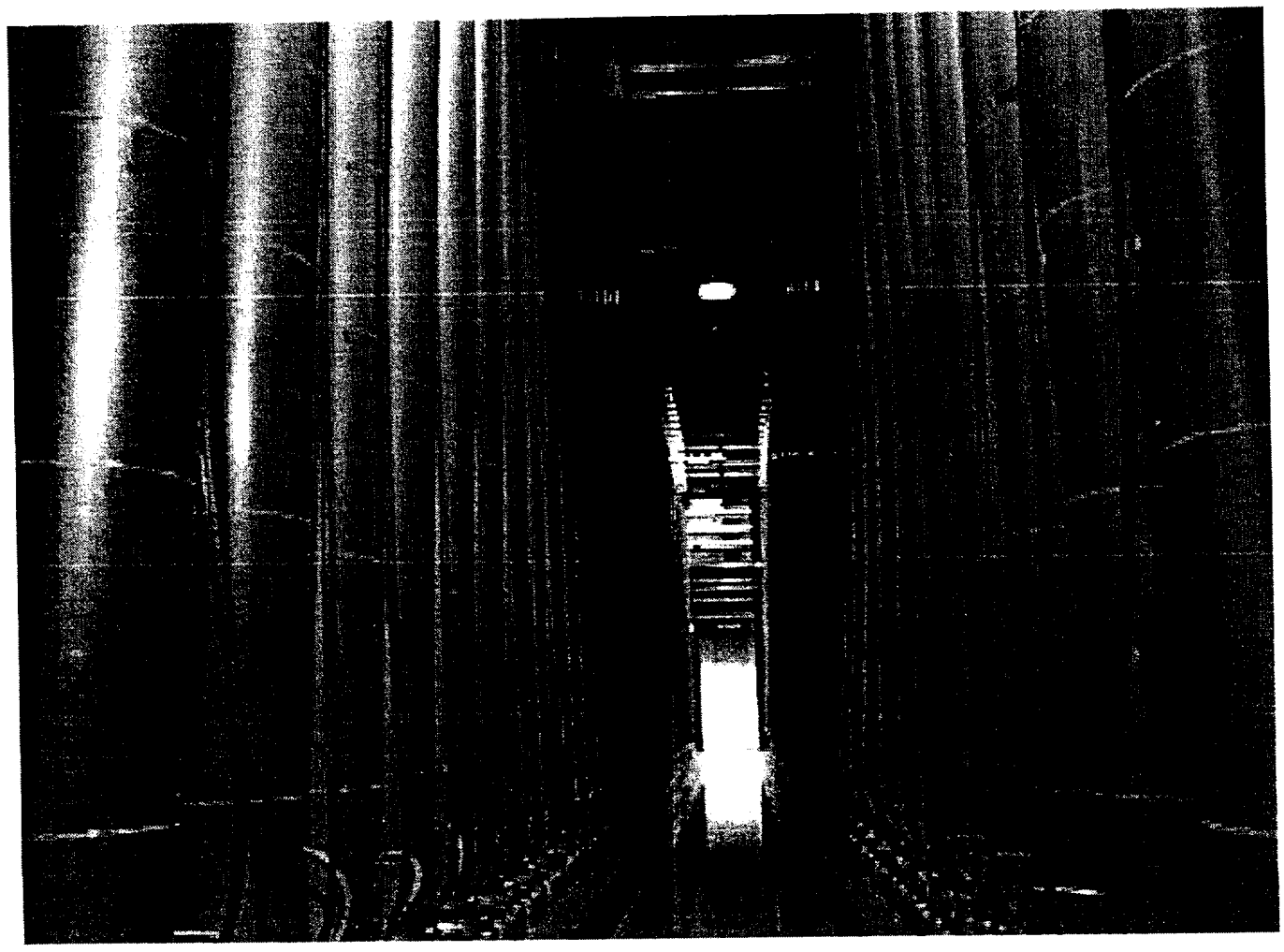
Filled Cascade



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Prerequisites for the Project

- **Assured Licensing Process**
  - **Short & Predictable**
- **Customer Commitment**
- **Access to US Tails Disposal Route**
- **Location on Existing Nuclear Site**
- **US Project / Engineering Expertise**
- **Nuclear Site Operating Expertise**

Enrichment Plant Timeline - 1

Pre Application Review	**Starting March 19, 2002**
Site Selection	**Q2 2002**
License Application Submitted / Environmental Report Submission	**Q4 2002**
Request License Approval	**Q2/3 2004**
Start on Site	**Q3/4 2004**
Building Complete	**End 2005**
1st Cascade On Line	**End 2006**
1 MSWU/yr Capacity On Line	**2007/2008**
Build up	**0.6 MSWU/yr**

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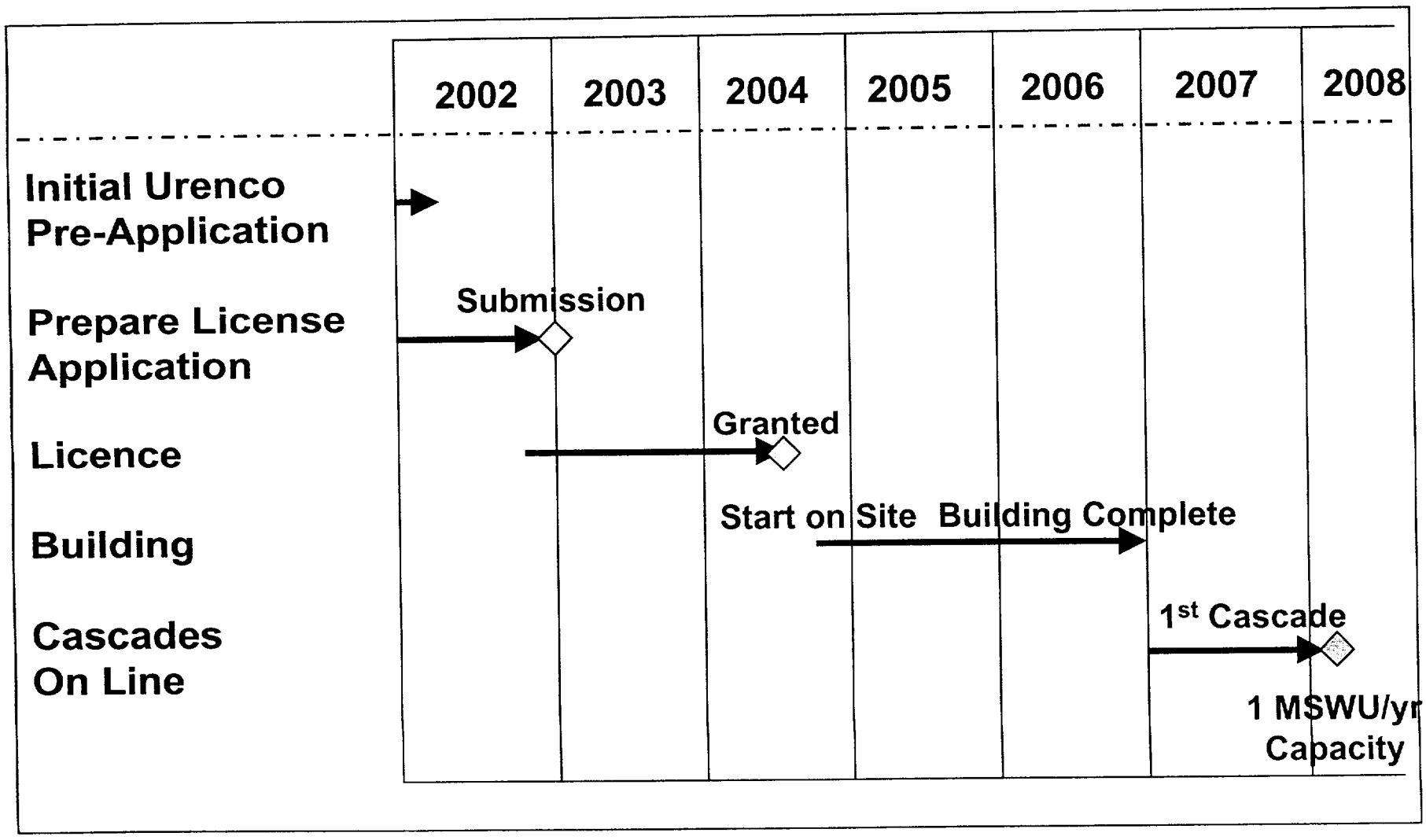
Enrichment Plant Timeline - 2



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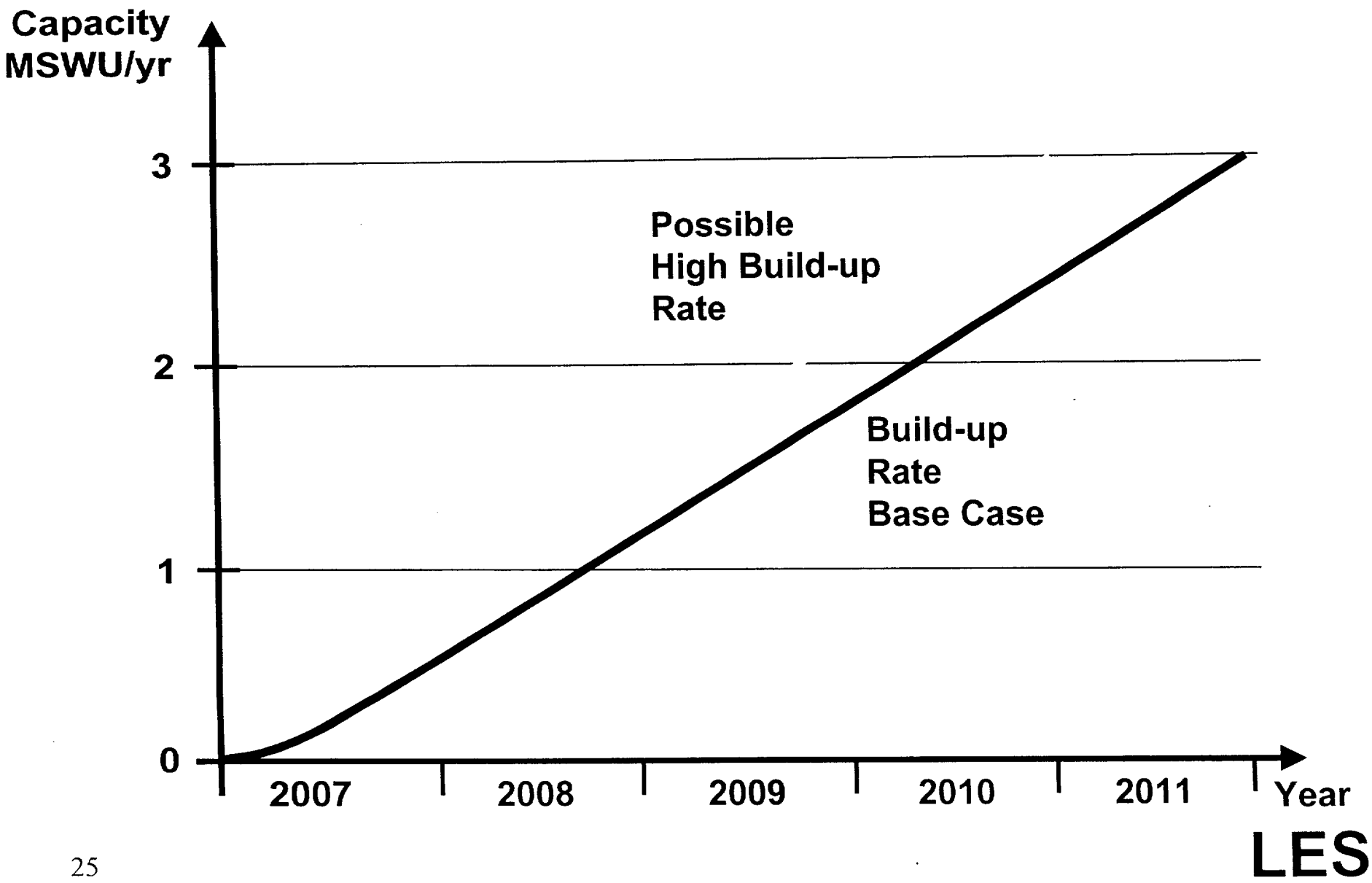
LES Capacity Build Up



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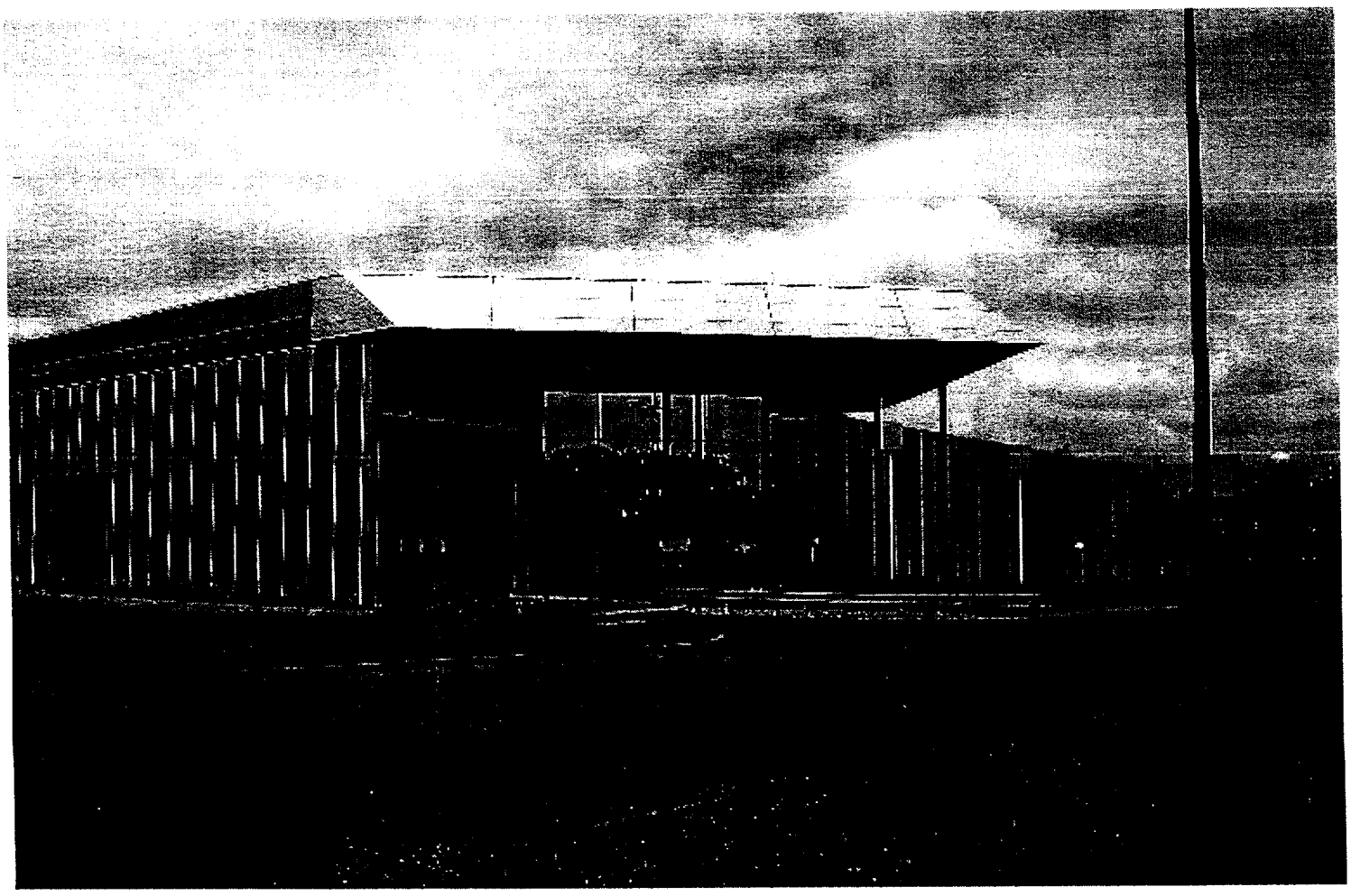
Overview of the proposed LES Centrifuge Based Uranium Enrichment Facility



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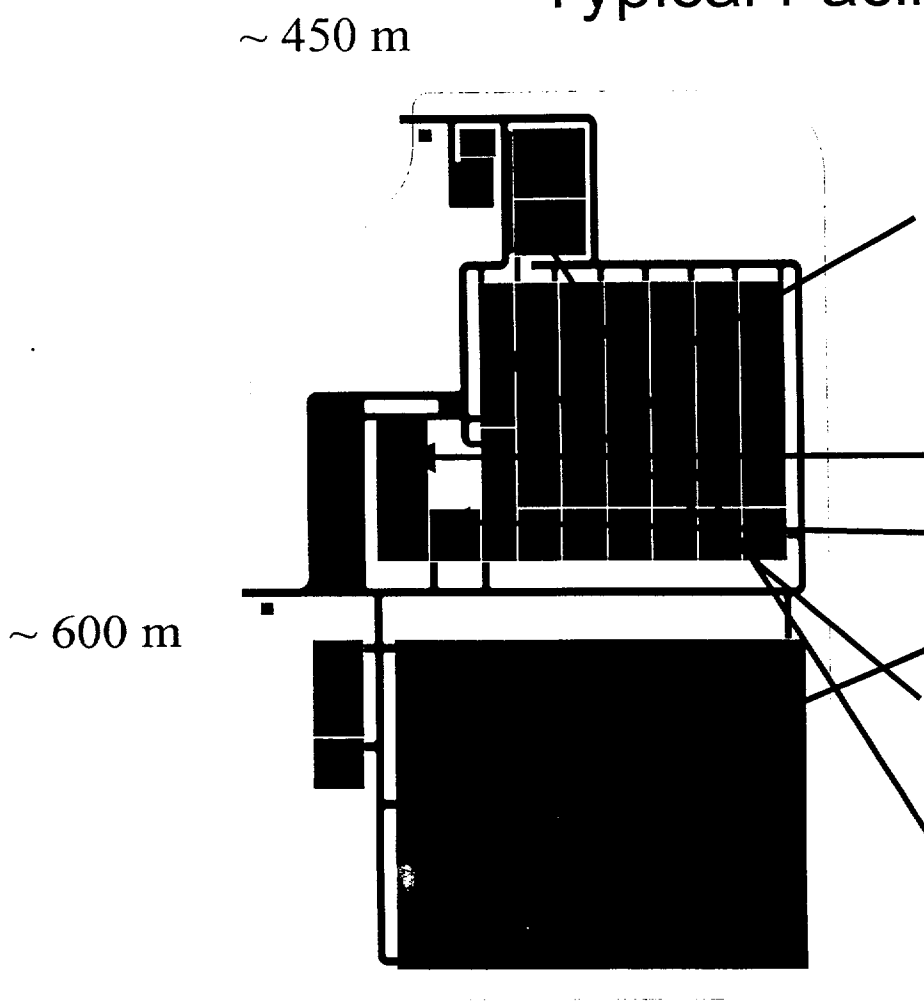
3000000 SWU/YR URANIUM ENRICHMENT FACILITY

Typical Facility Footprint



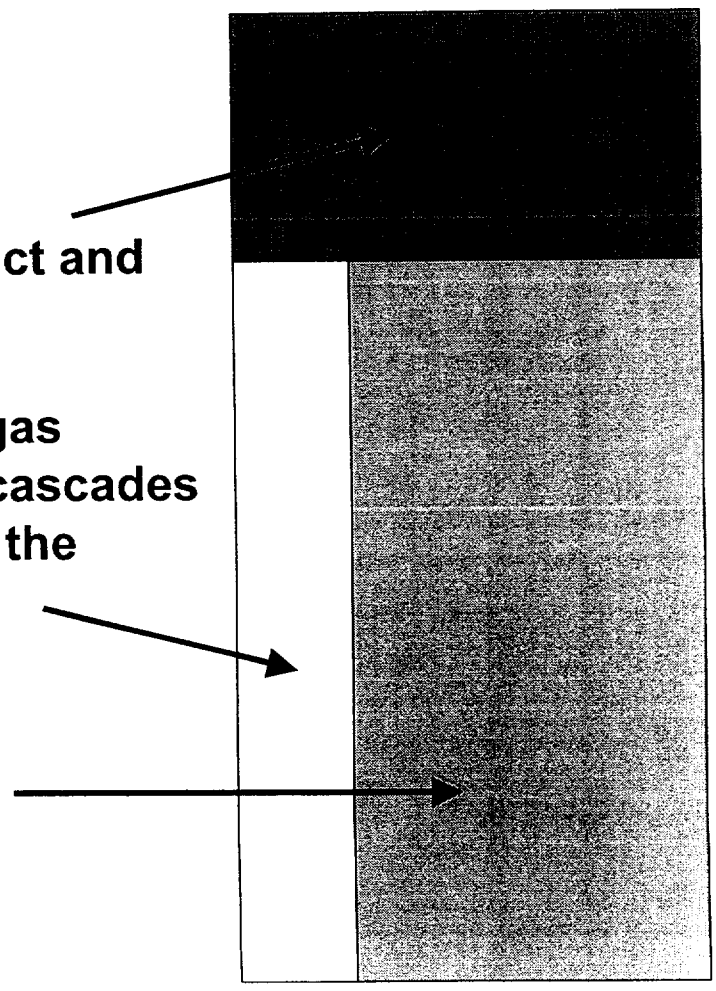
Comprises:

- Enrichment Plant
  - Separation Modules, Plant Services
- Operational Services
  - Cylinder Receipt / Dispatch
  - Blending & Sampling
  - Pads for Feed / Tails
- Technical Services
- Support Facilities
  - Centrifuge Assembly
  - Administration Building

LES

Enrichment Plant – 500000 SWU/yr Separation Module

- 3000000 SWU/yr Plant comprises six 500000 SWU/yr Separation Modules
- Each 500000 SWU/yr module comprises:
  - A UF_6 building containing the feed, product and tails take-off systems
  - A process services corridor housing the gas transport equipment which connects the cascades to the feed product and tails systems and the cascade evacuation systems
  - A Cascade Hall section which houses the separation system



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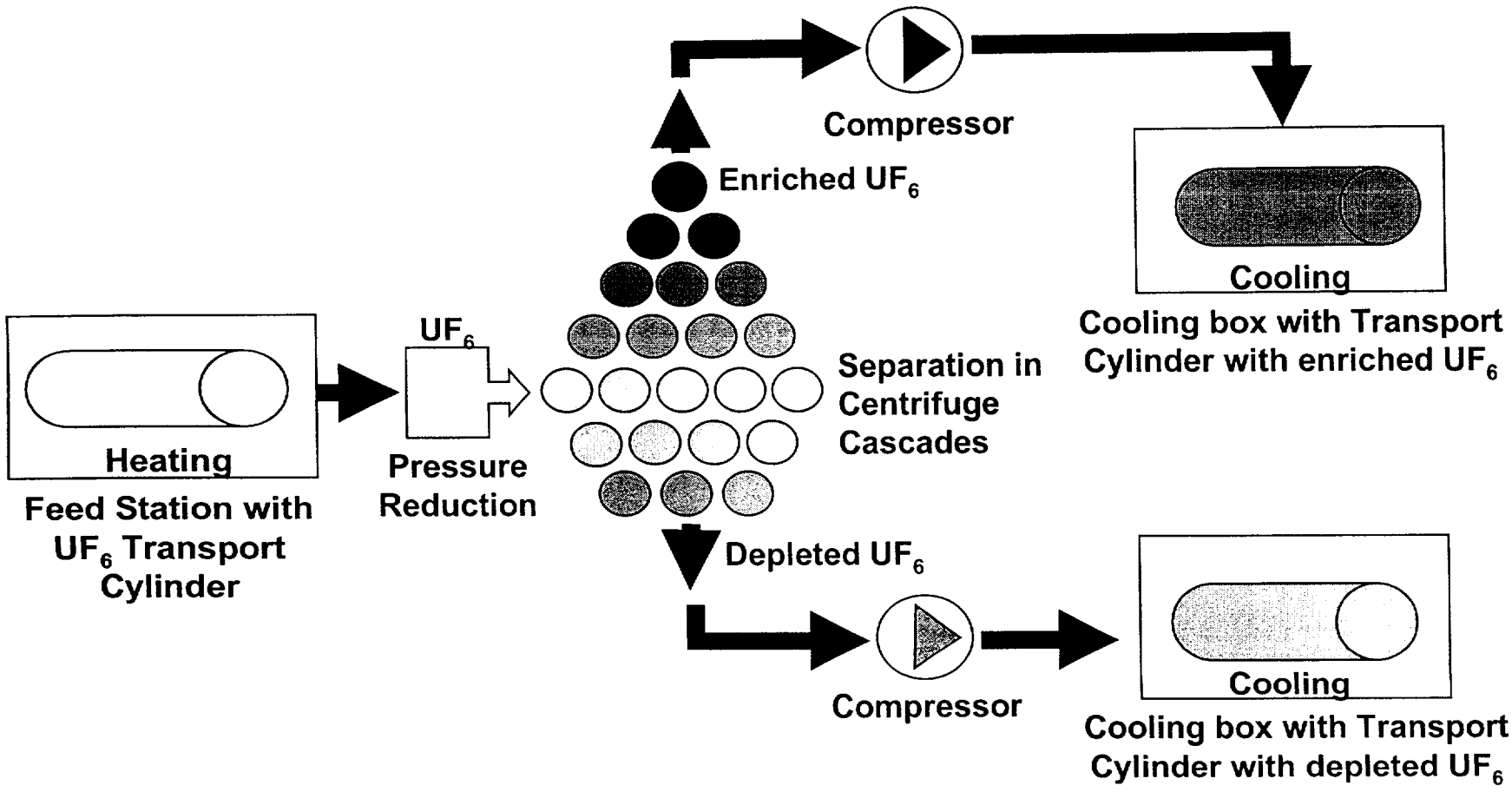
500000 SWU/yr Separation Module

The main UF_6 systems are illustrated below:-



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500000 SWU/yr Separation Module

Feed System

- Six electrically heated feed stations each housing a 48 inch cylinder with up to three on-line at any time
- Online weighing incorporated in stations
- Stations are side loading from rail transporter (as are all cylinder stations)

  No craning of cylinders
- Entire process is sub-atmospheric in solid and gaseous phases
- Pressure reduction step from feed cylinders to distribution manifold to cascades

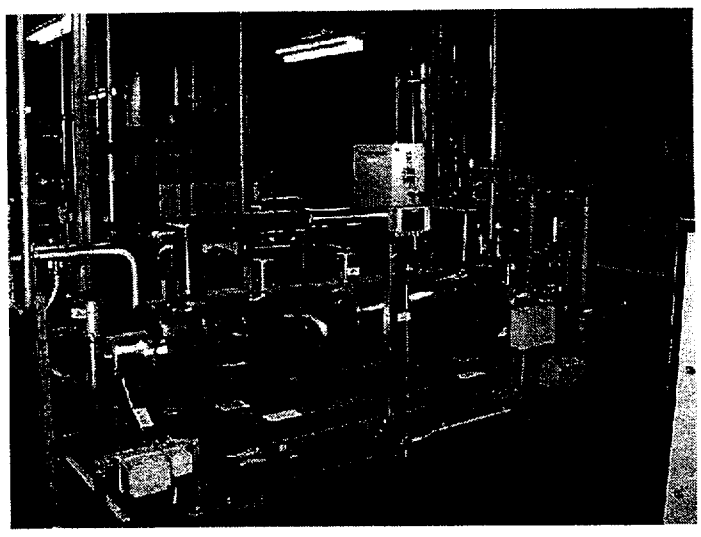
LES

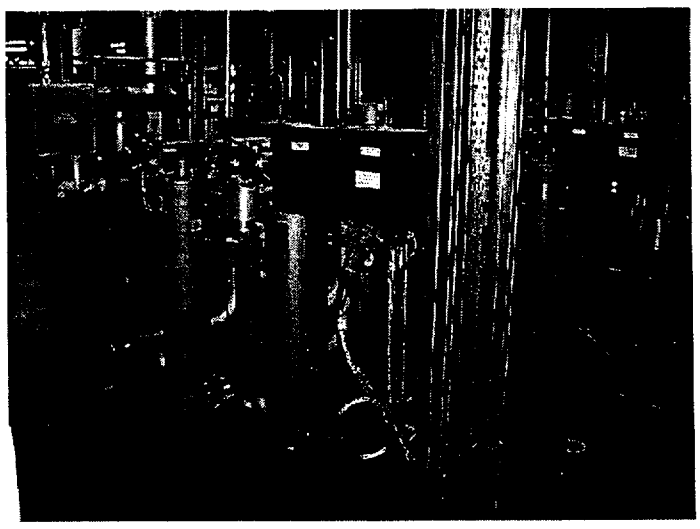
Separation Module

Feed Purification System

- Purpose is to remove ingressed air and HF from feed material prior to admittance to cascades, also to fully empty cylinders prior to disconnection

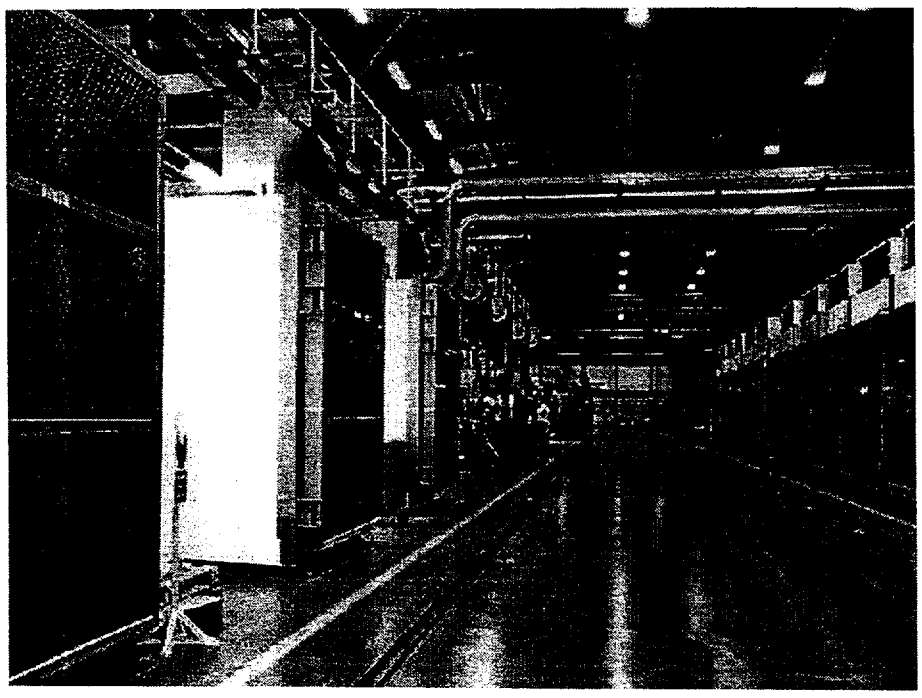
- Comprises :
  - two redundant air chilled 48 inch feed purification stations
  - two redundant UF_6 desublimers for light gas stream uranium separation
  - two redundant chemical trapping systems for light gas stream HF separation





Separation Module – Product Take Off System

- Six air chilled product take-off stations, up to three are on-line at any one time.
- Online weighing incorporated in stations.
- Stations are flexible and can accommodate either 30 or 48 inch cylinders.
- Low pressure compressors pump product flow from cascades into the six air chilled take off stations.



Separation Module

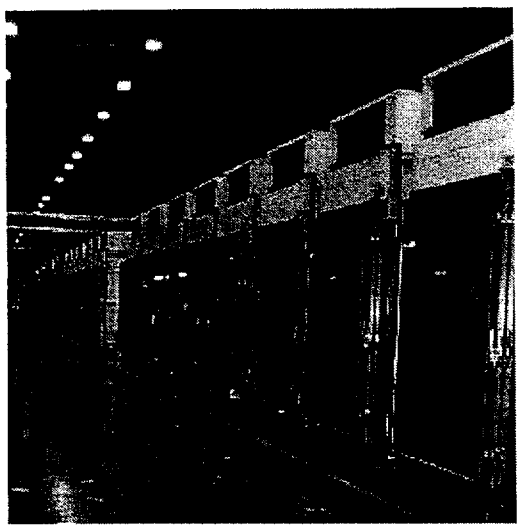
Product Vent System

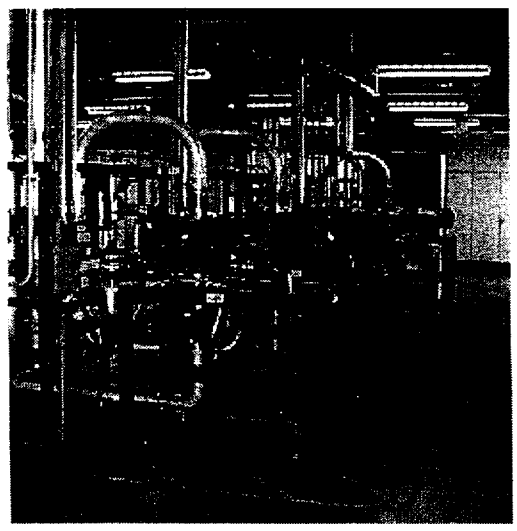
- Purpose is to remove entrained light gas, (air and HF) from the product flow.

- **Comprises:**
  - two redundant UF_6 desublimers for light gas stream uranium separation as feed purification.
  - two redundant chemical trapping systems for light gas stream HF separation.

Separation Module – Tails Take Off System

- Nine air chilled tails take-off stations, at least six are on-line at any one time
- Online weighing incorporated in stations
- Low pressure compressors pump tails flow from cascades to air chilled take-off stations

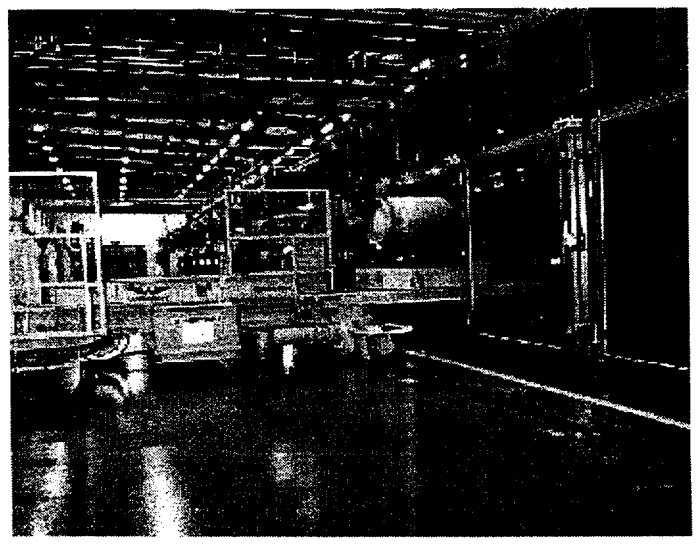




LES

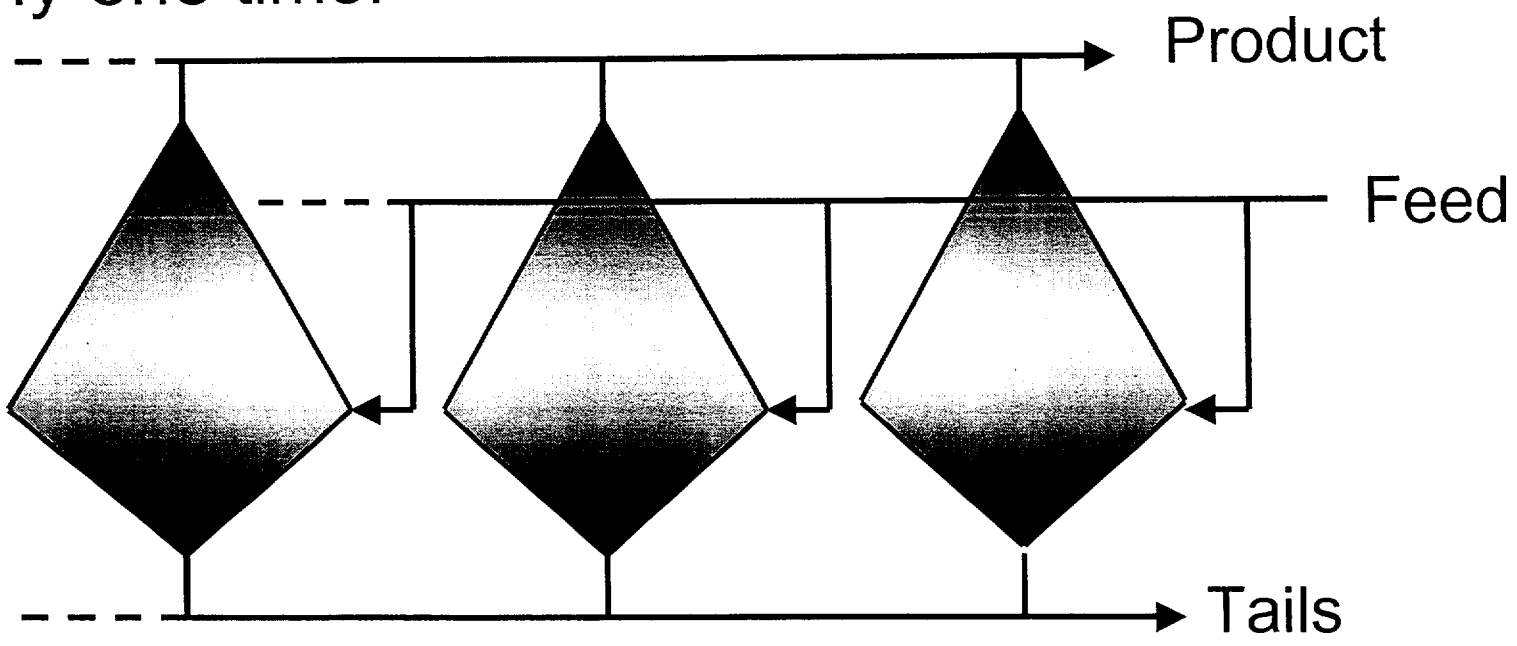
Separation Module – Cylinder Handling

- Rail Transporter for cylinder movements in UF_6 building
  - stations loaded from either side of rail track
  - draw bridge links transporter to station



Separation Module - Cascades

- The plant comprises six assay units, each assay unit consisting of a number of cascades connected in parallel producing a single product concentration at any one time.



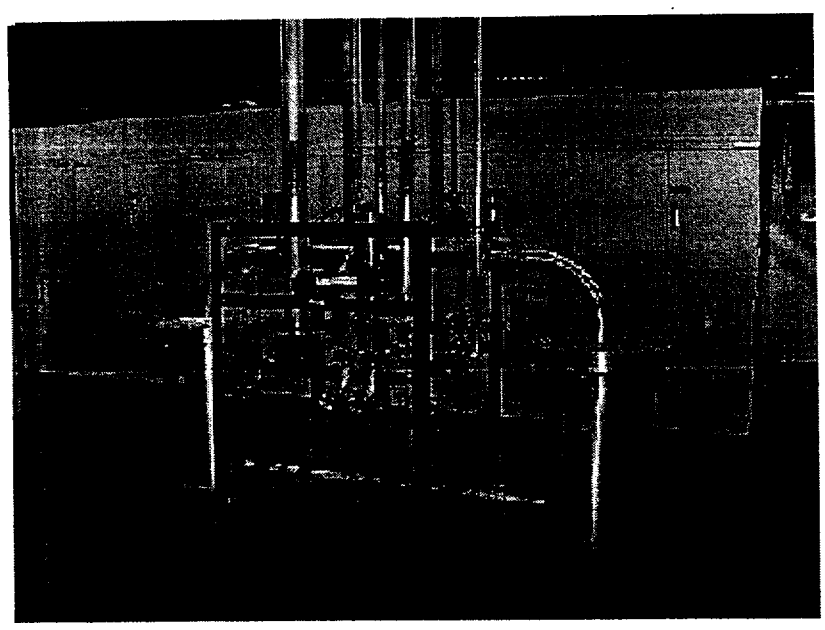
LES

Separation Module - Cascades

- The centrifuges and cascade pipework are housed in the cascade hall. No routine access in required.

- All services to the centrifuges including drive, cascade control and cooling water are located in the process service corridor.

- A cascade specific UF_6 emptying system using chemical trapping (dump) is located in the process service corridor.



Operational Services

The Operational Services required in support of the receipt, storage and dispatch of cylinders are as follows:-

- Cylinder Receipt and Dispatch Building including Product Store
- Pads
- Blending and Transfer
- Liquid Sampling

Cylinder Receipt and Dispatch Building including Product Store

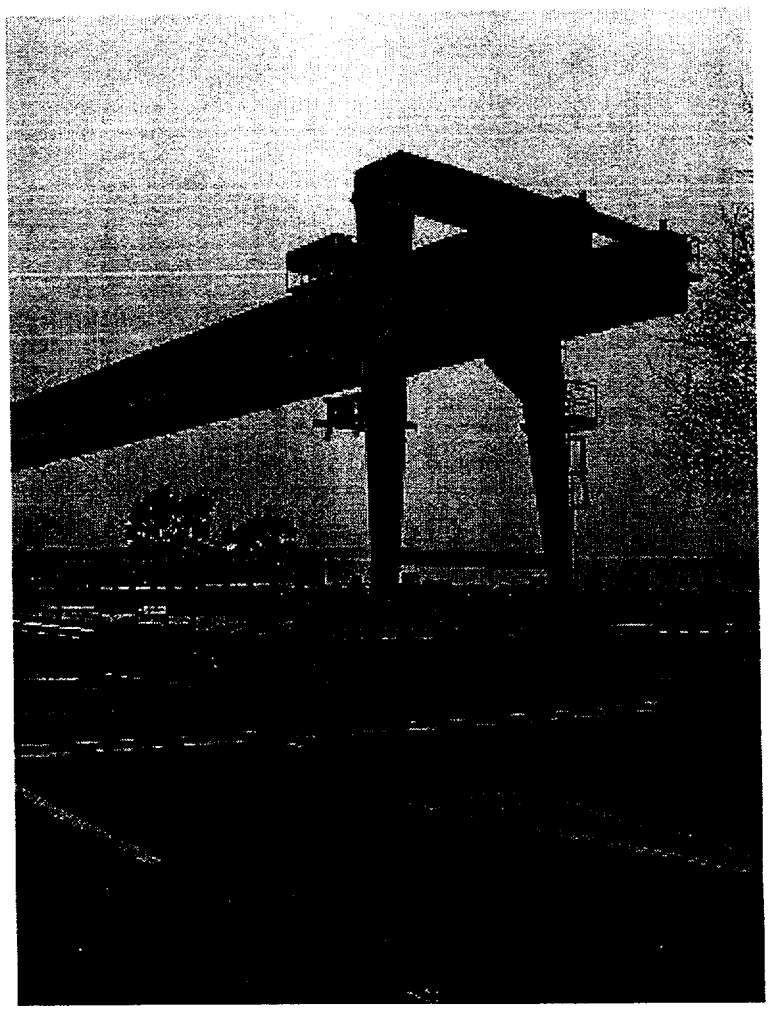
This building provides:

- Truck loading / off loading bays for 30 and 48 inch cylinders
- Cylinder pressure test bay
- Product cylinder storage
- Inventory weighing facility
- The building is provided with travelling crane coverage

LES

Pads

- Pad storage is provided for:
  - Buffer feed cylinder storage
  - Tails cylinder storage
- Pad travelling crane coverage is provided



LES

Blending and Transfer Facility

- This facility comprises electrically heated donor stations (capable of taking 48 or 30 inch cylinders) which are able to flow UF_6 to air chilled receiver stations containing 30 inch cylinders

- The process occurs at sub-atmospheric pressure

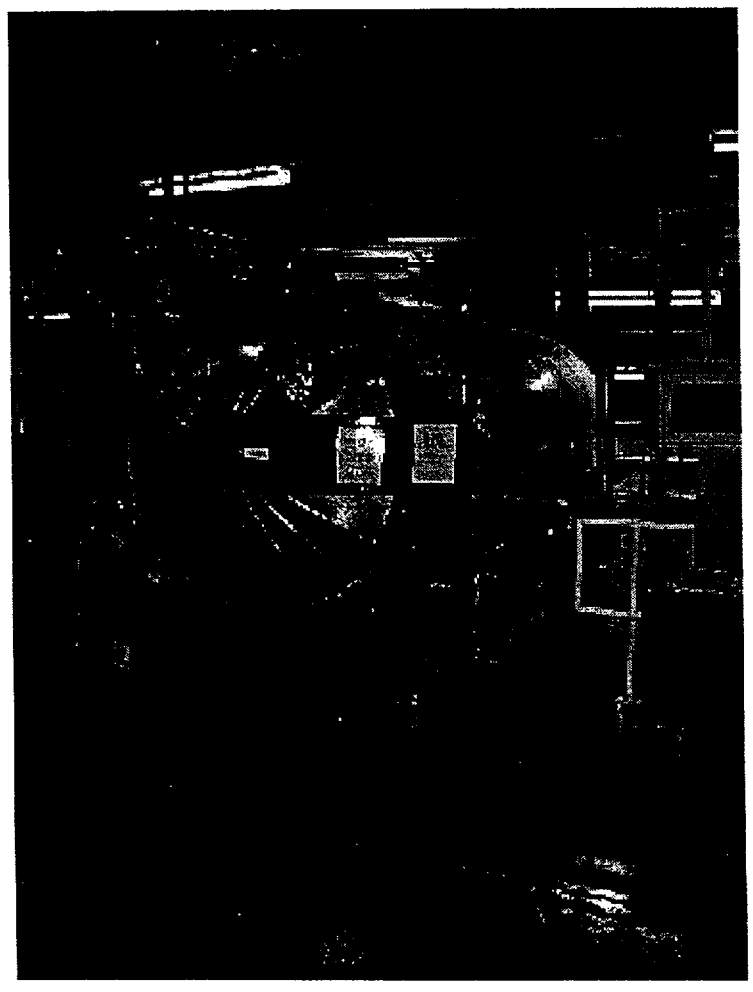
- The purpose of the facility is to enable customer product concentrations to be made up from stock materials

- The facility also provides the ability to transfer material from one cylinder to another (e.g. from a 48 inch to say six 30 inch cylinders) without necessarily blending

Liquid Sampling

- The Liquid Sampling Facility comprises electrically heated autoclaves which liquefy the contents of the 30 inch product cylinders

- The samples are drawn from the liquid phase, following which the autoclaves are cooled down



Supporting Infrastructure

The Technical Services required to support the operation and maintenance of the Enrichment Plant are as follows:

- Component Decontamination Facility
- Liquid Effluent Treatment Plant
- Contaminated Stripping Area
- Clean Build Area
- M E I & C Maintenance Workshops
- Laundry
- Pump Oil Recovery
- Residue Store
- Chemical Store
- Rad. Prot. Laboratory
- Chemical Laboratory
- Clean / Contaminated Change Room

* Some of these technical services may be available on the chosen site

Supporting Infrastructure

Centrifuge Assembly Building

- This building is provided to receive kits of components from Europe and assemble the kits into centrifuges for installation into the separation plant cascade halls

- Required during plant construction. No planned ongoing centrifuge maintenance or replacement

Administration Building

- This building provides accommodation for those personnel not accommodated in the separation plant, technical services or operational service areas

And finally, some facts and figures.....

- **Typically operation of a 3000000 SWU/yr enrichment facility will:**
  - **Require ~ 18 MVA electrical power (dual supply)**
  - **Require ~ 8,600 te UF6 Feed per year**
  - **Produce ~ 7,800 te DUF6 per year**
  - **Produce ~ 800 te UF6 enriched Product per year**
  - **Take delivery of ~ 700 full feed cylinders (48Y) per year**
  - **Dispatch ~ 350 product cylinders (30B) per year**
  - **Produce ~ 12 te / year LLW (unprocessed)**
  - **Consume ~ 6 std m^3 / min of Gaseous Nitrogen**
  - **Consume ~ 21 l / min of Liquid Nitrogen**

PRINCIPAL DIFFERENCES BETWEEN THE ORIGINAL LES ENRICHMENT PLANT AND THE CURRENTLY PROPOSED LES PLANT

LES

Key technical differences between the original LES plant (for simplicity call LES-1) and the plant now proposed for construction in the USA (for simplicity call LES-2) can be grouped into the following three main categories:

- Inherent site differences
- Separation plant differences
- Internal infrastructure (utility / support system) differences

SITE CHARACTERISTICS

- **Site has not yet been selected**
- **Site selection criteria broadly the same**
  - low seismology
  - land not previously contaminated
  - moderate climate
  - redundant good quality electrical supplies
- **One significant difference is that LES intends to construct the facility on an existing nuclear site**

SEPARATION PLANT DIFFERENCES

Overall Plant

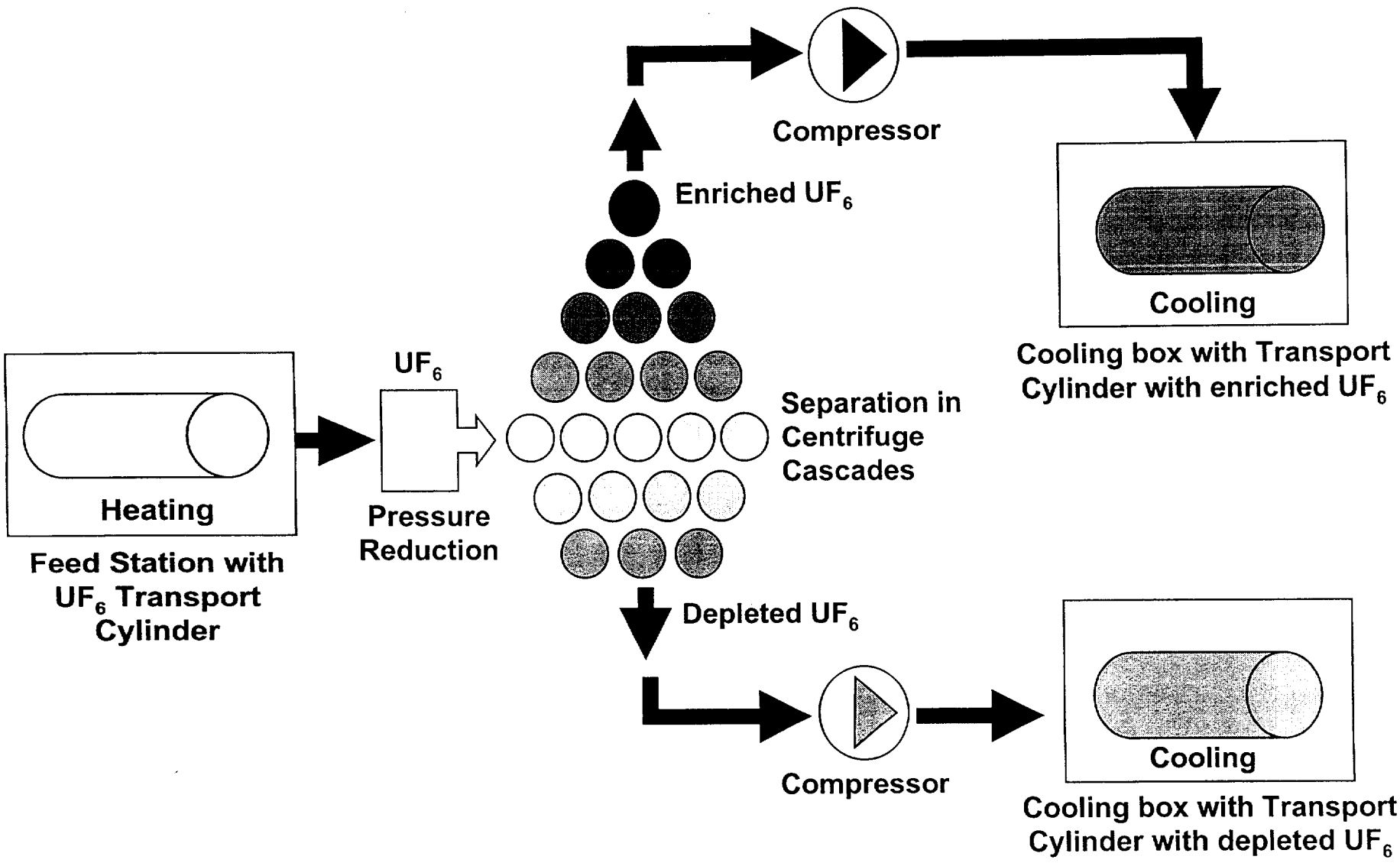
- Current LES-2 projected capacity is 3 million SWU/yr, while LES-1 was a nominal 1.5 million SWU/yr plant (6 modules @ 500,000 SWU/yr compared to 3 modules @ 500,000 SWU/yr)

- Urenco plants are currently designed to safely produce up to 6 % enrichment while the LES-I plant was designed for 5 %

- The blending and liquid sampling facilities were housed within the UF6 Building in LES-1 whereas in LES-2 the current proposal is to house them in a separate building

- Layout of plant will change to reflect the above, and site specific requirements

Flow of UF_6 through the Enrichment Plant



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FEED SYSTEM

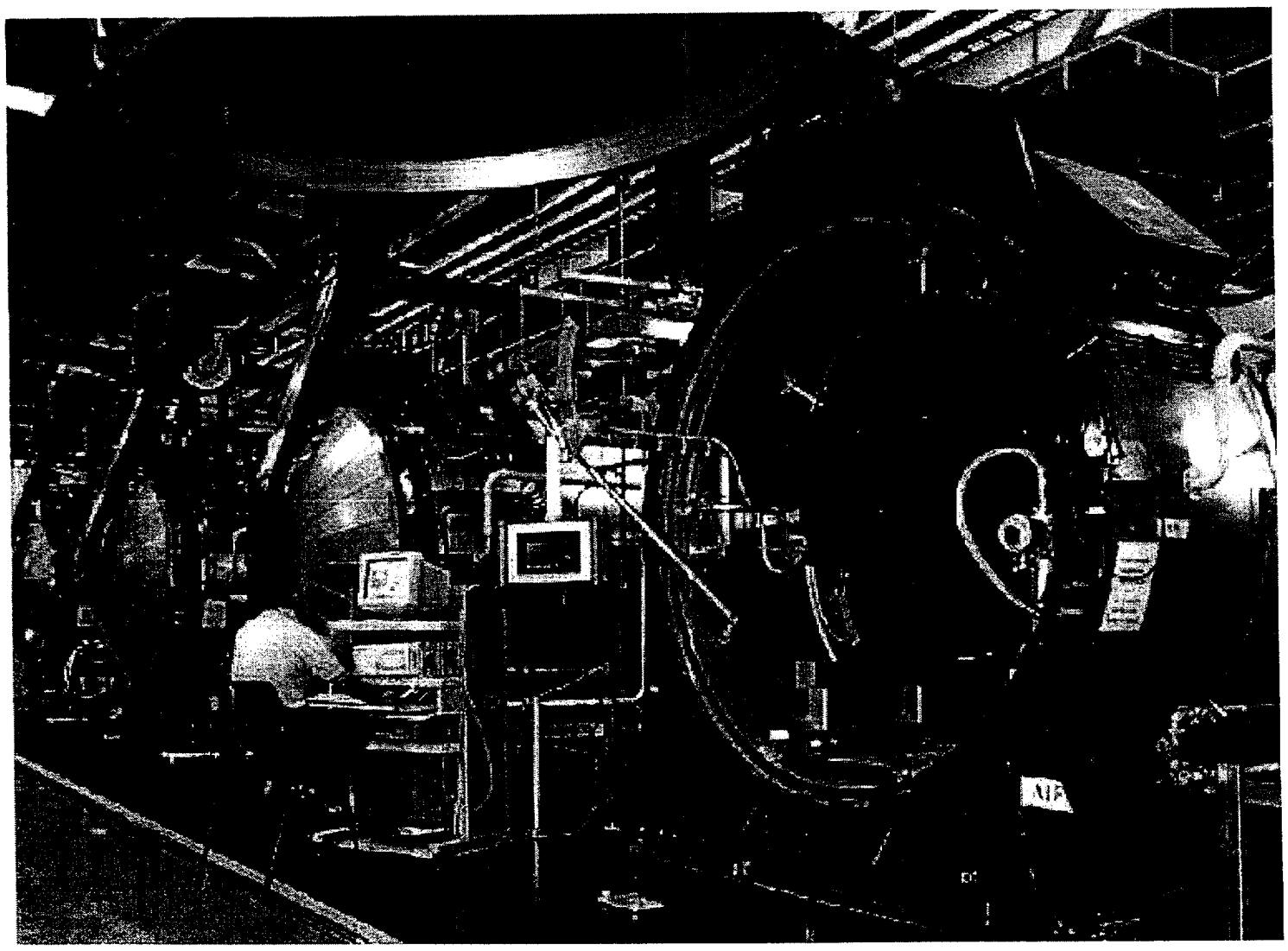
- **Urenco has now eliminated feeding from the liquid phase (using autoclaves) and now only feeds from the solid phase at sub-atmospheric pressures using feed stations.** ***This results in an inherently safer process.***

- **The capacity of the feed purification desublimer has been reduced from 500 kg down to approximately 50 kg and the maximum operating temperature has been reduced from 50°C down to ambient temperature.** ***This results in an inherently safer process.***

- **All Freons have been eliminated from the heating / cooling systems of the feed purification desublimers,** ***resulting in a more environmentally friendly system.***

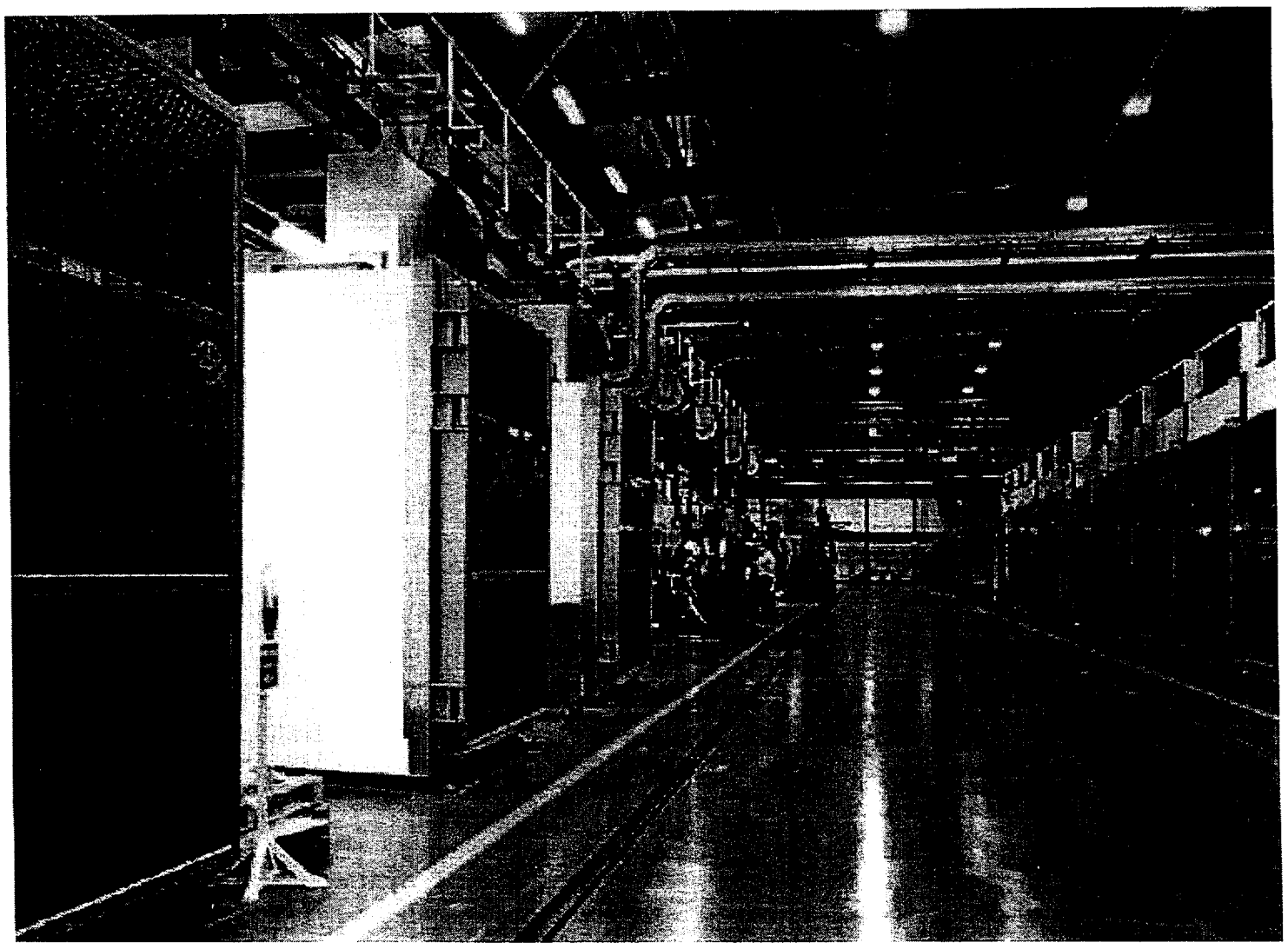
- **The feed purification cylinder station now operates at – 25°C, rather than at 4°C as previously,** ***resulting in a more environmentally friendly system.***

FEED AUTOCLAVE (LES-1)

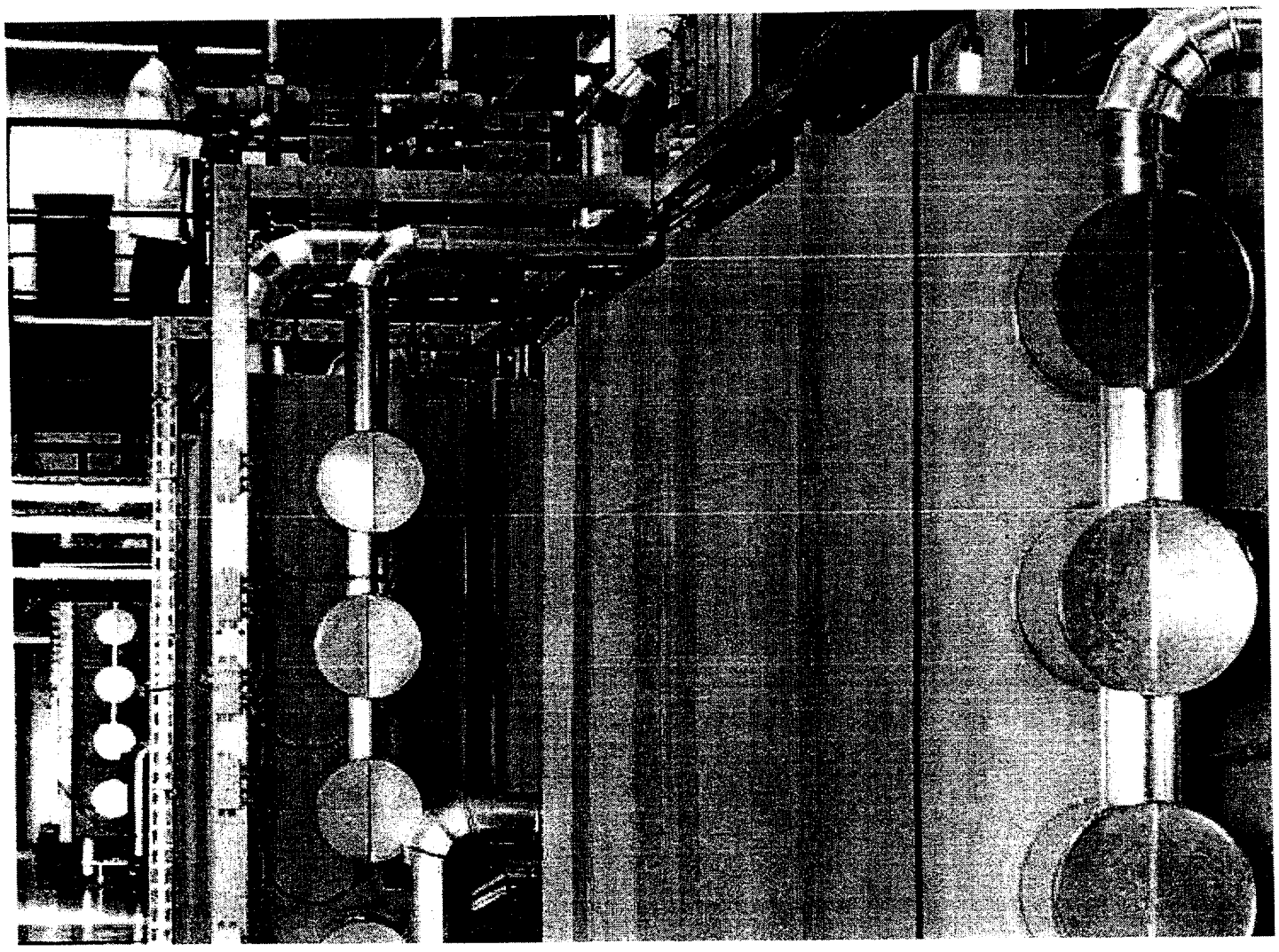


LES

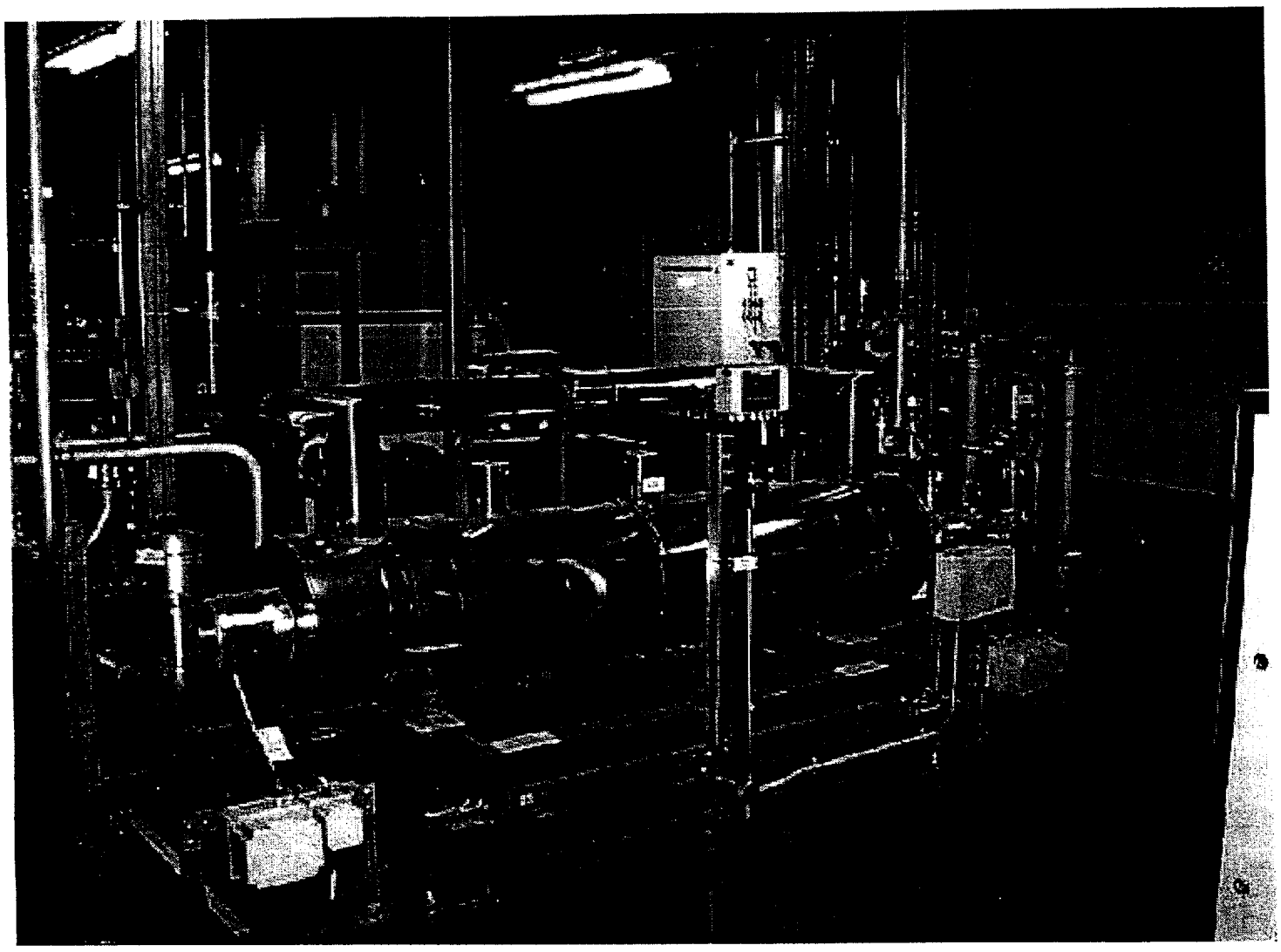
SOLID FEED STATION (LES-2)



FEED PURIFICATION DESUBLIMER (LES-1)



FEED PURIFICATION DESUBLIMER (LES-2)



CENTRIFUGES / CASCADES

- **Urenco will use the same centrifuge type in the LES-2 plant as envisaged for the LES-1 plant**
- **The number of machines per cascade will be somewhat greater in the LES-2 plant**
- **The number of cascades per module (assay unit) will reduce accordingly**

PRODUCT TAKE-OFF SYSTEM

- **Urenco has redesigned the product take-off system to dispense with the second stage of pumping. Take-off is now into cylinder stations cooled to –25°C. (The removal of second stage pumping eliminates the potential fault scenario of the second stage pumps discharging to atmosphere).** ***This improved design results in enhancement of safety and less impact on the environment.***

- **Cascades no longer have dedicated low pressure pumps, these pumps are provided on an assay basis, ie shared between cascades.** ***This results in fewer maintenance activities and thus lower worker dose.***

- **The product vent desublimer is identical to the feed purification desublimer, ie has been reduced in capacity and utilises no Freons. It is critically safe by geometry.** ***This improved design results in enhancement of safety and less impact on the environment.***

TAILS TAKE-OFF SYSTEM

- **Urenco has redesigned the tails take-off system to dispense with the second stage of pumping. Tails take-off is now into cylinder stations cooled to –25°C. *This new design results in enhancement of safety and less impact on the environment.***

CONTINGENCY DUMP SYSTEM

- **Essentially the same system as LES-1 but Urenco has added pumping capacity on a cascade rather than an assay basis**

GASEOUS EFFLUENT SYSTEM

- **Essentially the same system as LES-1**

SEPARATION PLANT SUMMARY

		ENHANCEMENTS	
System	**Feature**	**Safety**	**Environmental**
Feed	**Solid feed station**	✓	
	Smaller desublimer	✓	
	Lower temperature purification		✓
	Elimination of Freon		✓
Product	**Low temperature take-off + removal of 2nd stage pumps**	✓	✓
	Smaller desublimer	✓	
	Elimination of Freon		✓
Tails	**Low temperature take-off + removal of 2nd stage pumps**	✓	✓

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INTERNAL INFRASTRUCTURE (UTILITY / SUPPORT SYSTEMS)

Internal infrastructure differences are site specific. Currently known key differences between LES-1 and LES-2 are as follows:

Utility / Support System	LES-2	Remarks
Criticality Accident Alarm System	European design available	Not required for LES-1
Plant Control System	Urenco plants incorporate state-of-the-art software control and (independent) protection systems	LES-1 technology obsolete
Blending Facility	LES-2 design utilises donor stations operating at sub-atmospheric pressures	LES-1 design autoclaves / super-atmospheric pressures obsolete
Refrigeration Systems	Plant does not incorporate any Freon systems	LES-1 systems obsolete
Oil Recovery System	Process as LES-1 but design considerably improved	Non-recoverable oil now eliminated from all UF_6 systems

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SUMMARY

SIGNIFICANT CHANGES

- ❑ Plant Capacity
- ❑ Design Enrichment Level
- ❑ Elimination of Feed and Blending Autoclaves with Significant Lowering of Process Pipework Pressures
- ❑ Elimination of Large Hold-up Desublimers and Freon Usage
- ❑ Elimination of 2nd Stage Pumps
- ❑ Introduction of Low Temperature Take–off Stations
- ❑ Introduction of State-of-the-Art Plant Control System

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General Approach to Licensing

LES

Interface/Organization

- **Licensee is Louisiana Energy Services (LES)**
- **US organization is being assembled**
- **Licensing interface through Rod Krich, Exelon Nuclear, on interim basis**

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Applicable Regulations and Guidance for Application

❑ Principal Regulations

- **10 CFR 40, "Domestic Licensing of Source Material"**
- **10 CFR 70, "Domestic Licensing of Special Nuclear Material"**

❑ Principal Guidance Documents

- **Regulatory Guide 3.25, "Standard Format and Content of Safety Analysis Reports for Uranium Enrichment Facilities," December 1974**
- **NUREG - 1520, "Standard Review Plan for a License Application for a Fuel Cycle Facility," February 2002**
- **NUREG - 1513, "Integrated Safety Analysis Guidance Document," May 2001**

Treatment of Unchanged Licensing Information

- **Review existing Safety Analysis Report (SAR) through Revision 21**
- **Review NRC Safety Evaluation Report (SER) (NUREG-1491), January 1994**
- **Identify unchanged licensing basis information that has been accepted by the NRC**
- **LES to propose treatment of unchanged information**

Application Schedule

- ❑ **Pre-application review March - September 2002**
  - ■ **Submittal schedule (prior/after meetings)**
- ❑ **Advisory Committee on Reactor Safeguards (ACRS)**
- ❑ **Application submittal (SAR, Environmental Report) - 4th quarter 2002**
  - ■ **Electronic format**
  - ■ **Units**
- ❑ **Proposed NRC approval by 2nd or 3rd quarter 2004**

Future Issues and Topics for Pre-application Review

Proposed Prioritization of Meeting Topics and Schedule of Pre-application Review Meetings

Proposed Pre-Application Meeting Schedule and Prioritization

- ❑ **Mid-April**
  - ■ **Policy Issues (e.g., environmental review criteria)**
- ❑ **Mid-May**
  - ■ **Codes and Standards**
  - ■ **Security**
- ❑ **Mid-June**
  - ■ **Review and Handing of Restricted Information**
- ❑ **Mid-July**
  - ■ **Plant Control Systems**
  - ■ **Conduct of Operations - transfer of operating experience**

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Proposed Pre-Application Meeting Schedule and Prioritization, cont'd

- **Mid-August**
  - **Site Characterization**
  - **Quality Assurance Program/Classification of Structures, Systems, and Components**

Wrap Up - 1

- Urenco has a proven technology and a successful history of plant construction
- The project has US utility and industry backing
- The lessons learned from the LES project provide an excellent starting point

Wrap Up - 2

- LES is providing the following:
  - A well proven and efficient enrichment technique
  - Plant design based on proven safety case, operating in Europe
  - Incorporating provisions for decommissioning and mid term UF_6 tails storage

- LES is asking for:
  - Assured short and predictable licensing process
  - Access to US disposal route