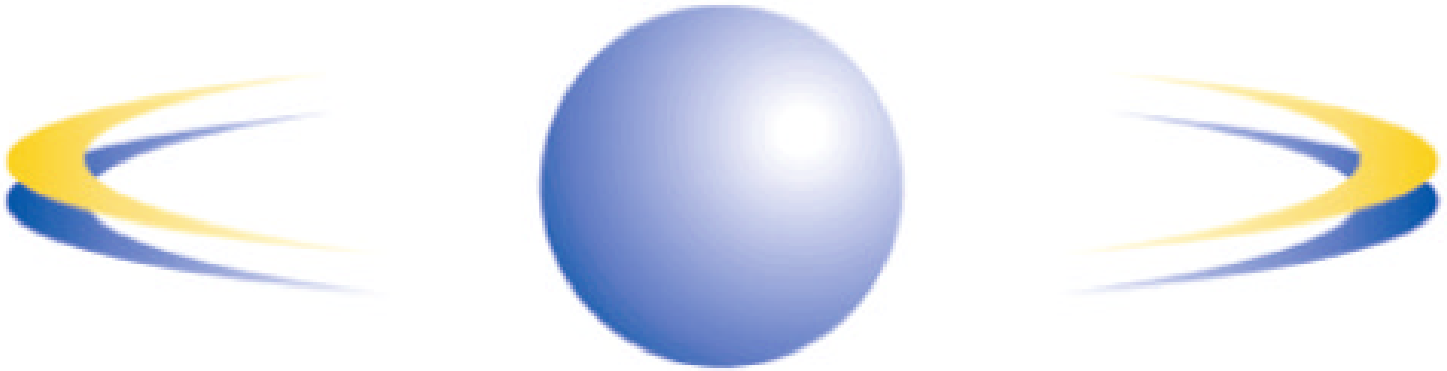


P B M R

US DOE Orientation Presentation
Pebble Bed Modular Reactor
August 7, 2003
DOE's Germantown Offices

0900 – 0915	Opening Remarks	Regis Matzie
0915 – 0945	PBMR Executive Overview	Ed Wallace
0945 – 1045	Demonstration Plant Design Overview	Dieter Matzner
1045 – 1100	Break	
1100 – 1130	The Choice of Fuel Design	Dieter Matzner
1130 – 1230	Core Design	Johan Slabber
1230 – 1315	Lunch	
1315 – 1345	Thermo-hydraulic Cycle and Thermal Design	Johan Slabber
1345 – 1445	Demo Plant SSC Testing Program	Dieter Matzner
1445 – 1500	Break	
1500 – 1530	Fuel	Johan Slabber
1530 – 1600	Future R&D Development Path for PBMR-VHTR	Dieter Matzner
1600 – 1700	General Discussions	All

US Department of Energy Orientation Seminar on Pebble Bed Modular Reactor Introduction

7 August 2003

Dr. Regis Matzie

PBMR Board of Directors /
Westinghouse Senior VP

OPENING REMARKS

Purpose of this Seminar:

To provide a technical and programmatic update of the South African PBMR project to DOE, NRC and other interested US government personnel

Introduction of PBMR Speakers

- Ed Wallace - PBMR General Manager, Projects
- Dieter Matzner - PBMR Engineering Manager
- Dr Johan Slabber - PBMR Senior Nuclear Consultant

Current PBMR Investors

- Eskom – South African national utility
- Industrial Development Corporation of South Africa – national development finance institution
- British Nuclear Fuel plc – global nuclear fuel cycle company (parent of Westinghouse Nuclear) solely owned by the UK government

Status of PBMR Project

- Current investors have expressed their intention of proceeding to the detailed design and construction phase (December 2002)
  - Solid business case
  - Technical issues remaining manageable
  - Political environment positive
  - Public opinion satisfactory
  - Initial utility client to launch project
- Further interest in project by potential additional investors
- Well aligned with US Hydrogen Initiative

PBMR Overview

7 August 2003

Ed Wallace

General Manager, Projects

PBMR History

1993 Option Identified under Eskom long term planning

Selection Criteria

- Competitive Economics (with CCGT/Eskom coal)
- Distributed Generation (independent of fuel source)
- Short Lead Times (reduce risk of capacity mismatch)
- Load Following (increased commercial pressures)
- Reduced Environmental Impact (no emissions)

PBMR History

1993 Option Identified under Eskom long term planning

1995 Pre Feasibility Study undertaken

The Real Targets

$1000/kWe installed

24 months construction

400m EPZ

Key Strategies

- Strict adherence to standardization
- Use of international strategic suppliers
- Minimum market disruption (module size)
- Use of simple systems and operations
- Minimum required maintenance
- Achieve inherent safety (no moving parts)

PBMR History

1993 Option Identified under Eskom long term planning

1995 Pre Feasibility Study undertaken

1997 Initial Concept Design & Costing completed

1999 Detailed Feasability Study started

Eskom LOI for Demo + 10 Modules

2000 Cabinet Support & Commercial Partners

Formal Nuclear Licence & EIA applications

2001 Fundamental Safety Case Philosophy Accepted

SAR rev 1 submitted to NNR (Licensing Authority)

Plant Target Specifications

• Rated Power per Module (Commercial)	165 MW(e)
• Eight-pack Plant	1320 MW(e)
• Continuous Power Range	20-100%
• Module Construction Schedule	24 months (1st)
• Planned Outages	30 days per 6 years
• Seismic	0.4g
• Aircraft (Calculations to survive)	747/777
• Overnight Construction Cost	$1000/kWe
• Fuel Costs & O&M Costs	9 mills/kWh
• Emergency Planning Zone	<400 m
• Availability	>95%

PBMR History

1993	Option Identified under Eskom long term planning
1995	Pre Feasibility Study undertaken
1997	Initial Concept Design & Costing completed
1999	Detailed Feasability Study started
	Eskom LOI for Demo + 10 Modules
2000	Cabinet Support & Commercial Partners
	Formal Nuclear Licence & EIA applications
2001	Fundamental Safety Case Philosophy Accepted
	SAR rev 1 submitted to NNR (Licensing Authority)
2002	Sept 2 Business Case completed (S&L/McKinsey)
	Oct 30 Submittal of Final EIR

- Mar 24 NNR favorable Licensing Assessment Issued
  May 16 Eskom re-confirmed commitment to PBMR
  June 25 EIA RoDs Issued for Demonstration at Koeberg and Pilot Fuel Plant at Pelindaba

Current Full Time Staff

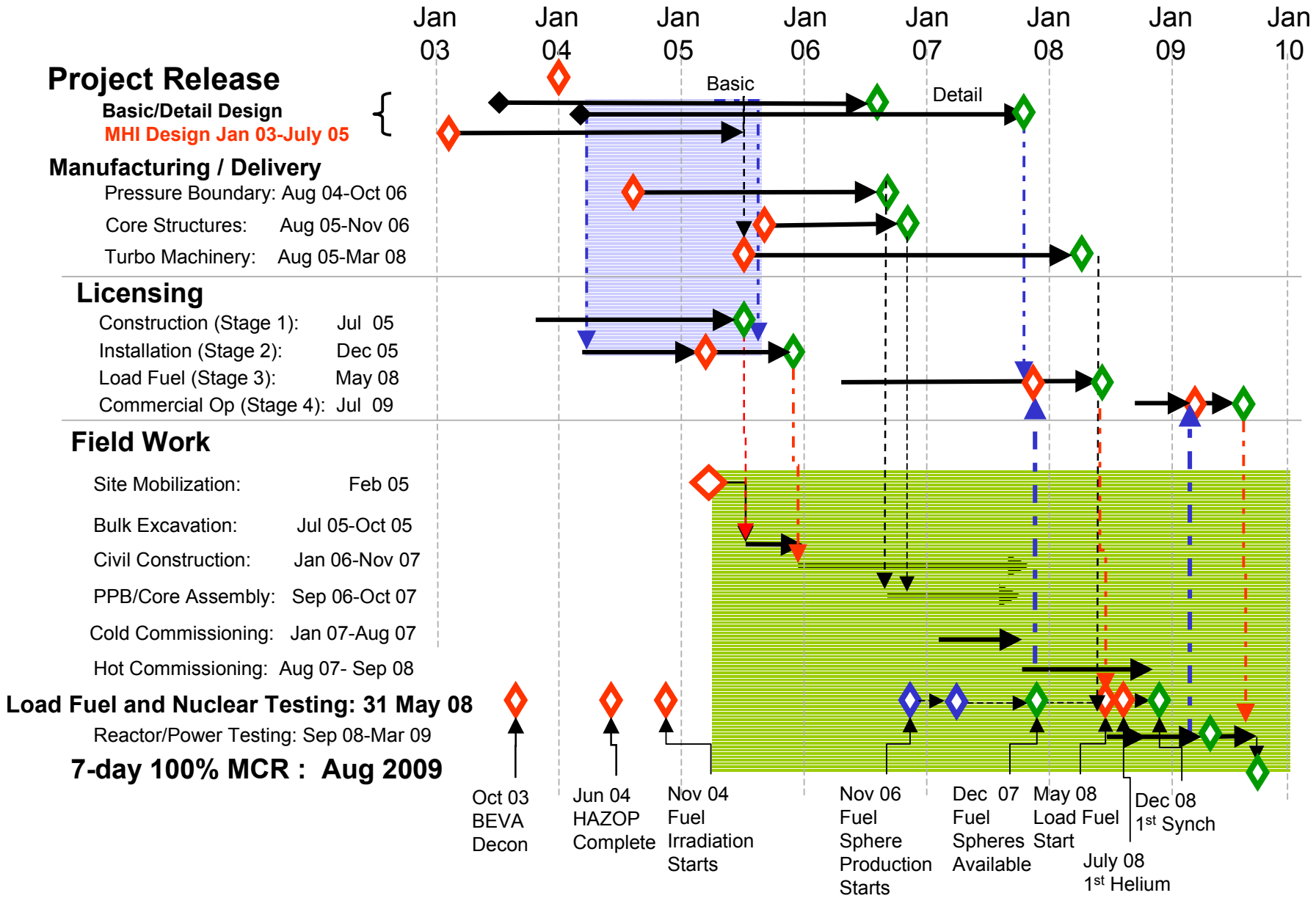
• PBMR	280
• M&RES / S&L	40
• IST Nuclear	60
• MHI / NFI / SGL…	90
• Eskom (Client Office)	30
	===
	~500

Total manhours to date	~2,500,000
Total costs to date	~$125m
	(~$300m US equivalent)

Key Suppliers

• Mitsubishi Heavy Industry	Turbo-Machinery
• NFI/Nukem	Fuel Technology
• SGL (Germany)	Graphite
• Ingersoll Rand (USA)	Recuperator
• IST Nuclear (RSA)	Nuclear Aux.
• Westinghouse (USA)	Instrumentation
• Ensa (Spain)	Pressure Boundary
• IVV-2M (Russia)	Fuel Testing
• Fabritech (RSA)	Gas Cycle Valves

Demonstration Phase Schedule



Commercialization Scenario

ID	Task Name
1	**Demonstration Plant**
2	Engineering & Delivery
3	Delivery
4	Load Fuel
5	First Synchronisation
6	
7	Second TurboUnit Develop, Deliver & Install
8	Second Unit Earliest Potential Synch
9	
10	Start EIR for a Multi-Module
11	**FIRST RSA MULTI-MODULE**
64	Contract Order
65	Equipment Procurement Starts
66	Construction
93	Post Load Fuel Commission
102	Handover
103	Unit 1 Handover
104	Unit 2 Handover
105	Unit 3 Handover
106	Unit 4 Handover
107	Unit 5 Handover
108	Unit 6 Handover
109	Unit 7 Handover
110	Unit 8 Handover
111	**US Design Certification**
112	**US Hydrogen Initiative**
113	Study
114	DFS Design
115	Construction Release
116	Commissioning