

9404-11 3,226 fo<sup>2</sup>

VFA-0455, 27

005 80, 17

150mb

2a/9/04

70

www.y12.doe.gov/news/

PF center cycle 2004

AVLIS - Product portfolio Review Report  
-U

www.nnsa.doe.gov

Y12 are already going out

B-61 CSA CEP BWXT 5mes May 2006

B61 A6357

p 38x/20



Physical Chemist - advised common

Metallurgist / Materials Scientist - materials ageing mechanisms

Inorganic Scientists - research + review advanced materials + processes

NMR Spectroscopist - assess lifetime of <sup>organic</sup> materials

+ develop new replacement materials

Analytical Chemist - assess support materials ageing + surveillance

Organic Materials Chemist - develop new organic/polymeric materials

Polymer Chemist - development of new formulations + materials

(+ what may apply to explore + non-explore opportunities)

Materials Chemist Industrial Plant Studies - - - -

+ undertake low material age

- provide synthetic chemists solutions to material challenges

Inorganic Materials Chemist - investigate novel materials

Organic Materials Chemist - develop new organic materials

Theoretical Chemist - help understand + explain synthesis of new materials

Head of Materials Science Research - strengthen capabilities in new product development

LEP program:

WUCA AF&F

← 'new upgrade'

Cost of build at AWR

RRV →

Sped on Rev Sin 2005

RE179

~~1988~~ 1980 Deussen

1988 - F&P

1992 - he needed delimit

WE177 - Aug 59 - open request OR1177

WE177A - ~~de base~~ 1<sup>st</sup> dytogen 1966  
A - 1971

Polin 62 → 68

JA 12cb

By file - 25cb

Wid - 6cb

— kind (of

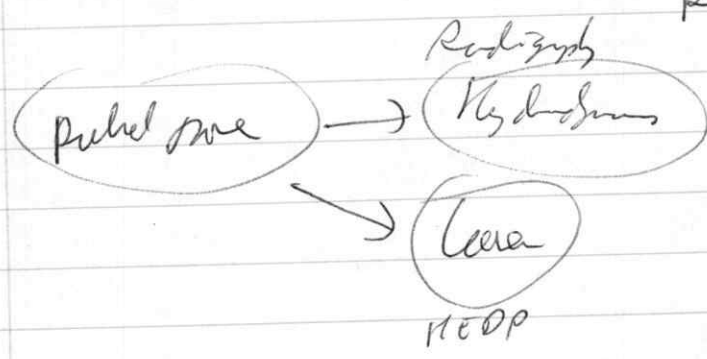
— in W&S for 2cb

Raw 1.5

Perf W&S 3

Seja 1

Perf W&S 3C



$$\begin{array}{r} 2 \ 1 \ 3 \ 4 \\ 1 \ 2 \ 4 \ 3 \\ \hline 3 \ 3 \ 7 \ 7 \end{array}$$

$$\begin{array}{r} 1 \ 2 \ 4 \ 3 \\ 4 \ 5 \ 11 \ 10 \end{array}$$

SMR  
 SNMCRF  
 - selected for center 02/05

$\phi$  819.8m

$$\begin{array}{r} \text{Eds} \quad \text{Late} \quad \text{Ren} \quad \text{No} \\ 3 \quad 3 \quad 7 \quad 7 \\ 2 \quad 3 \quad 1 \quad 1 \\ \hline 5 \quad 6 \quad 8 \quad 8 \end{array}$$

	<u>Eds</u>	<u>Late</u>	<u>Ren</u>	<u>No</u>
Set Rel	2	1	3	4
Red Set	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{4}{7}$	$\frac{3}{7}$
US	$\frac{2}{5}$	$\frac{3}{6}$	$\frac{1}{8}$	$\frac{1}{8}$
Cost	$\frac{4}{9}$	$\frac{3}{9}$	$\frac{2}{10}$	$\frac{1}{9}$
76	$\frac{2}{11}$	$\frac{2}{11}$	$\frac{1}{11}$	$\frac{1}{10}$

early  
late  
none

Most Reliable -

Replacement  
late  
early / none }

Refurb  
94+16 2010  
+16 2026  
+16 2042  
+16 2058  
refurb  
① 2010-20  
② 2026-36  
③ 2042-50

Most Safe →

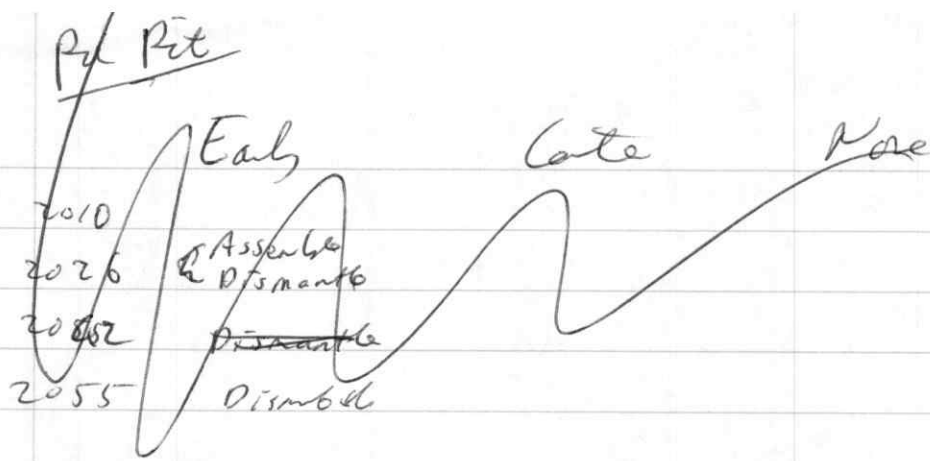
Wasteful and/or - early  
late  
none

Production hazard -

Refurb	Early Replacmt	Late Replacmt	No Replacmt
2010-20	HE Refurb	HE Refurb	HE Refurb
2026-36	HE dismantl HE build	HE Refurb	HE Refurb
2042-50	HE Refurb	HE dismantl HE build	HE Refurb
2055-60	HE dismantl	HE dismantl	HE dismantl

	1	2	3
HE Refurb	1	2	3
HE dismantl	1	1	1
<del>HE Refurb</del>	2	3	4
<del>HE dismantl</del>	1	1	1
HE Refurb	1	1	1
HE dismantl	1	1	1
HE Refurb	3	2	1
Total	5	5	4

Remove HE	2	3	4
As Inbuilt HE	1	2	3
	3	5	7
Remove IHO	2	1	1
Inbuilt IHO	2	1	1
	4	2	2
	7	7	7



<u>Pu Pit</u>	<u>By</u>	<u>Replace</u>	<u>No Replacement</u>	<u>Remanufacture</u>
		Assemble Disassemble Disassemble	Disassemble	<del>Refurb</del>
	Assemble	1		1
	Disassemble	2	1	2
	Total	3	1	3
<u>BeShell</u>	Assemble	-	-	1
	Disassemble	1	1	2
		1	1	3
<u>Secondary NEU</u>	Assemble	1		1
	Disassemble	2	1	2
		3	1	3

How does ~~organ~~ continuous build affect this?

Component Life	Refurb
NE - 16 yrs!	2010 → 2026 → 2042
Pu Pit - 60 yrs	N/A
2nd NEU - 60 yrs	N/A
2nd CompX - 30 yrs	2024
AF&F - 30 yrs	2010/17 → 2040/47.

What are MOD considering?

What are AWC considering?

- what are key sub-questions?

→ What is the best way to provide warheads for SSBN up to 2055? (2060?)

best → ① most reliable

→ ② safest

→ ③ cheapest

→ ④ minimal impact / US Sp.

+ relationship between option

→ (by having an up-to-date complete <sup>heres new</sup> infrastructure)

① What is the most reliable way to provide warheads for SSBN up to 2055?

Reliable → High probability of production denied, yield on target.

→ low risk of major problem which would affect reliability

→ good surveillance program which would detect any reliability problems

→ infrastructure to tackle any reliability problems + modify / replace warheads.

Most reliable → late replacement

" safe → early replacement

" cheap → early replacement? / no replacement

Low impact → late replacement?



ALC - e K - ry by Judd

- 156, 110

2002 - All WE177 sub assemblies dismantled  
All Chade dismantled - not -- -

⑥ US Sup →

Means to affect weighty →  
 Replacem<sup>t</sup> ~~the~~ Radiate Riskin Nigro

- Introduce new procedures
- new new fault
- ~~Refurbish~~ A90. - Meja refurbish.

2	1	3	4
1	2	4	3
4	3	2	1
4	3	2	1
4	4	2	1
<hr/>	<hr/>	<hr/>	<hr/>
15	13	13	10

Order by -  
 S+R only  
 + cost  
 + US  
 all.

NE  
~~HE~~ Manufature Rules

	<u>Ear</u>	<u>late</u>	<u>Revan</u>	<u>No</u>
Make NE	1	2	3	3
Make NE	2	1		
	<hr/>	<hr/>	<hr/>	<hr/>
	3	3	3	3
<u>Risk</u>	<u>lines</u>	<u>2nd lines</u>	<u>Highes</u>	<u>Highes</u>

1	2	4	4
1	2	4	4
4	4	2	1
<hr/>	<hr/>	<hr/>	<hr/>
7	10	10	12

α  
 ↑

Project - Laser  
MEFF  
Comps

Assembly  
Hydres

A-1 of Drive - 'to deliver quantitative data on materials properties in the high energy density regime

1986 - CAME developing ple-relevant coats for inter-rod stage coating needs for pit-rebuild project

In best lead and as substitute for Pu  
-AWO

→ as well as carbath + Pu

Rebach Ferraro

2,100

2,115

Hemishell

0.25 units

was created for

- weld - gas-metal-arc process; filler

Mixing with coolant →

Dry mixing → Cer water -  
grease for rub

Calcium Fluoride

EC1709

- 62% solid

1769

24% solid

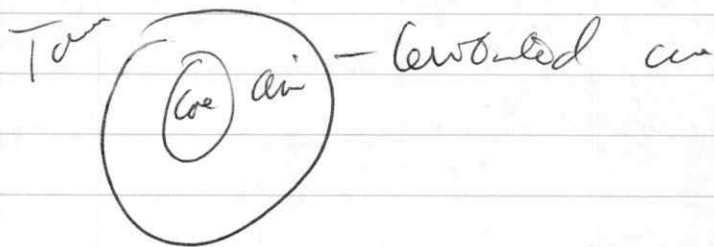
→ 5 Spray 155g EC1709

+ Dem-water + 1 lb.

or 130g EC1769

→ 65-72g solid/lb

HE pit 12 inches 5" thick



Temp - 1st run  $2\frac{3}{4}$  hr  
- late  $\frac{1}{2}$  -  $2\frac{1}{2}$  U

Uncompensated count of Pu 239 in  $U^2Be$   
 $\rightarrow$  4.4 kg

Mode pit run -

4 kg Pu; in  $U-6.3$  diameter.

thin Be de reflect

18 lb HE.  $\rightarrow$  for - 15 lbs.

500g salt @ 1%  $\rightarrow$  50 kg Pu

@ 4 kg / vial  $\rightarrow$  12 vials.

25 kg Be / 12  $\rightarrow$  2 kg Be / vial.

Be  
2.5 cm

Slabs

Fault 1 (Bly A - EA 1

Fault 2 → Main in EA 7

Fault 3 → North → EA 9 ← <sup>trichloroethane + ethanol</sup> → Bay 1/2  
South → EA 10 → Bay 3/4

$$V = \frac{4}{3} \pi r^3$$

1124 dwt (.9

As in 200m

⊙

Be produces neutrons

→ 30 neutrons per million & particles  
+ reflects neutrons

lit → 5-2015 lbs per lb lit

Delta phase fa - make stable with 1%  
gallium - SOTA Vol 1 p99

- Density 99 & lb / ft<sup>3</sup>

rod Be dwt → 5.5 lb/cm<sup>3</sup>  
Co ceramic - 2.25 lb/cm<sup>3</sup> → 10-20 lb  
H<sub>2</sub> gas - (1 lb/cm<sup>3</sup> → 1 lb)

up to 100 lb H<sub>2</sub> - 20/50 lbs

fuel 12g Tm<sub>2</sub> → 1 lb ket

STS pen for thermal 16/in<sup>2</sup> plus

130  
up to 100.

120  
90

160  
20

Sum 7  
SWITCH-07 7  
14

35

180

55

120  
55  
65

90  
+ 15

10  
40

105  
60  
165

& per year

07-

pt & per year! ca 99-07 - 32.

10/3/2000

Plan <sup>in 2000</sup> to start production ops in AUS

TRILE

- 1) Tridos ltr - yllpta by Sep 00 + do start maintenance program to road CE
- 2) Refin + Martin TR1 survival Prog; Complete vessels, plant & some activities; produce update from plan by Sep 00  
→ Martin Surv Prog to collect ltr & TR1
- 3) Complete Safety Studies  
→ Martin design baseline on ltr of system
- a) Annual Certificate issued

• Martin ltr capability to join main vessel cycle

A90 -

Comin 90-96 -

dis with the previous order.  
When AUS was he ordered to A90  
At due to be opened Oct 96.

A89 - white comin Mar 92 - Aug 92

A90 white com - 90+

A90 - due to be opened up - end 96 - complete order for  
other parts -

82-96 ltr

File path Dec '88

/ AUS order for refuel

An issue

- AWE changed their position

↓  
prod production ~~de~~  
not to fall by 50%  
in 2002

[<sup>for</sup> pto surveillance x2?]

↓  
substantive security  
surveillance

[ - which ~~was~~ could only have been some  
of SCT 1-7 + SWT 1-2 (5-4?) ]

What was the issue?

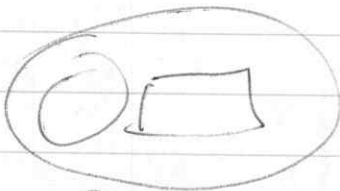
Ⓟ Why was more surveillance needed?

ⓐ Concern about cover ops issue - affects both

ⓑ <sup>prod + security</sup> life of T-ops would be extended <sup>- less likely</sup> → TH would be no D

ⓒ Current surveillance program was not adequate?

ⓓ Projected reliable life of workload.



ⓔ Adequacy of 1999 security plan to support COP.



Specific reasons for incremental approach

→  
Defer all development related to new warhead design effort (Orion / Hydrus +) until after US posture is clarified - i.e. post 2010.

[Are MOD already adopting this approach]

Build in reversibly?

→ Just don't do,

→ Why

→ Disadvantages of relying TAI -

Reduce progress of other designs / increase cost of prot. costs

Influences UK relationship with US

Distorts other MOD design - eg viability of new subs.

→ Advantages of not relying TAI -

Increase progress of design / reduce payments of prot. More money - incl for con form.

---

Should UK follow US lead -

3 core subs → would say about time - White Paper

450 more CASD pbs;

(Cites)

Re NPT -> Example (A&V)

-> What provision is ~~(being made)~~ / could be made for pen of disarmed?

-> Mandate opt out ~~as~~

[Money already spent]

Pm approach -> keep open 2 options

(a) ~~Keep open~~ (a) Future risk system

(b) Disarmament

-> More spend -> more 'more, along spend' arguments  
-> less emphasis on (b)

-> Spend limit / Decide at last minute  
-> more emphasis on (b)

-> Incremental step by step approach

-> With commitment to next stage as required at that point in time - cancellate always an option [who doesn't like + industry]

-> NLP policy should be driven by industry

-> Senior commitment of all employees

-> promise for communities affected by cancelled

-> Requires (potential public) scrutiny of what actually has to be decided / spent at each point.

robert.lindsay@blueyonder.com.au

New 712 Consolidated Manufacturing Complex

- Deuben products; units 10,000 ft<sup>2</sup> facility  
→ desktop cabinets.

1993 - A8 same time as 9000 - 11 same

on hazard factors associated with Deuben also  
scheduled to be studied

28/6/90 - incident in 9805-1 a deuben

15000 prefab units

9805-1	Deub prod	6,895	ft <sup>2</sup> A-5	] 1957 1959
9805	Deub gas storage	1,850	ft <sup>2</sup> A-3	

F72001 Feb 2000 - S.M.C +

The new facility is a dev. site partly integrated  
with the proposed workloads. The old production site facility  
is to be renovated → but funds → S.M.C.

F72000 Feb 1999 - Revisited plan with the pilot  
plant in 9805-1

F72003 Feb 2002 → re-evaluated process control + plan  
for in up at 712

'Sea Strike'

PF - at old 9720-1 area.  
- outside secure area,

911a - LLC bldg

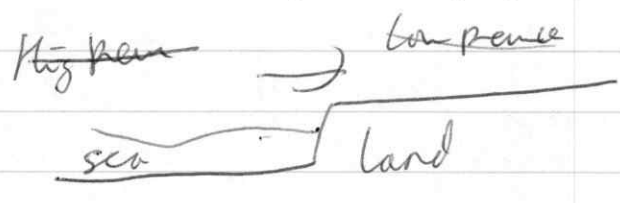
9720-1 - no warehouse - completed 1944

9201-115 - build 1/1/00

9204-1/a - 6/1/05

Seabreeze can bring fog along coast

Sea-breeze = breeze off sea



Fog

Warm air →

Cool air

water

Deabarium Prod Facility 1957.

9805-1 is 500 of 9201-a

~~9400~~ 9404-11 10000 sq ft 1944 P.F.

Mk-F - office, 5; 1/2

9420 - consolidated slabs - built 1980

9420-01-

As we pass the entrance we to build the "S.M. Pilot Plant Facility" inside 9805-1

9805-1 is the Deabarium production facility built 1957

Page

Cabinet + Bomb -

227

Treasury + DDA don't think new needed.

228

If no new - US would see as ally reducing def; production  
our share of staying Eur (re-fin);

- It not easy to see when Eur & UK would need new

235

Money already spent + Fr

241

Butcher's minority opinion

261

Optim will cost more than checks ?

26a

Understandable Damage

267

Treat for optima

RF

FY2001 Budget v pros  
- reliability of special materials process

FY2002 cap

'~~Identify~~ identify scoping required for special materials for re-certifying/re-rating part in support of the B617/11 FPU + the L76 FPU

FY2009 -

B61-11 FPU Jan 07

FY2009 - +FY2008

Strategic needs - include - the establishment of special processes (for SM).

→ + includes streamlining within manufacturing line

FY2007 Comp

Process Development → dev of enclosure technology for SM Complex to 912

FY2006

912 Org - 'continue SM characterization'

Dissolute → dissolving a solid substance with a solid

SMC Pt +

Jan 2002 - PT prototyping

"purification prototype faults"

- also considered design for 'Prodotto: Albite  
Progetto'.

Tracy -

"Disassembly + Special materials"

Bead

Brandy - Mp 237

Wine - Pu 238

LiK + D + handle in wet glove box

↳ head to moulture;

→ first stage - vacuum outgassing treatment before fit analysis

Partly LiK + D by remove O<sub>2</sub> + other elements

- by wet clean

lith<sup>form</sup> marks to be noted for 920a-2 to 920a-26

- except isolate per head in 920a-2

412 B61 CEP FPA about R406

06 - Lithium not doing exceedingly

920a-2 - but 1963 -

Early 1990s - some ~~equipment~~ major processes  
+ equipment replaced under the

'Lithium Proton Replacment'

- 920a-E -
- 1) Assembly ~~replacements~~ replace weapons
  - 2) Quality attributes of components +  
assemblies
  - 3) Dissassembly of other types  
at source of related types + components

Lithium separates into large quantities of  
remains - too large could not hit the  
legs contaminants -

For notes of 9720-06.

9201-5 AA Metals

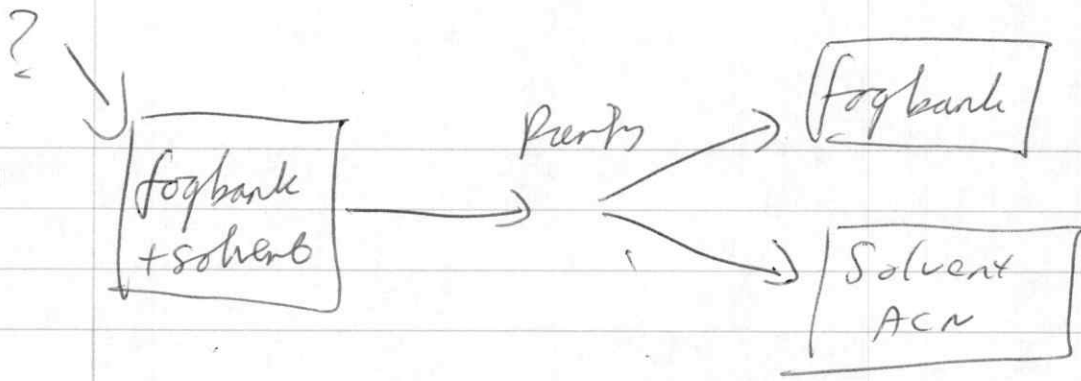
Water → Lithium → Hydrogen

---

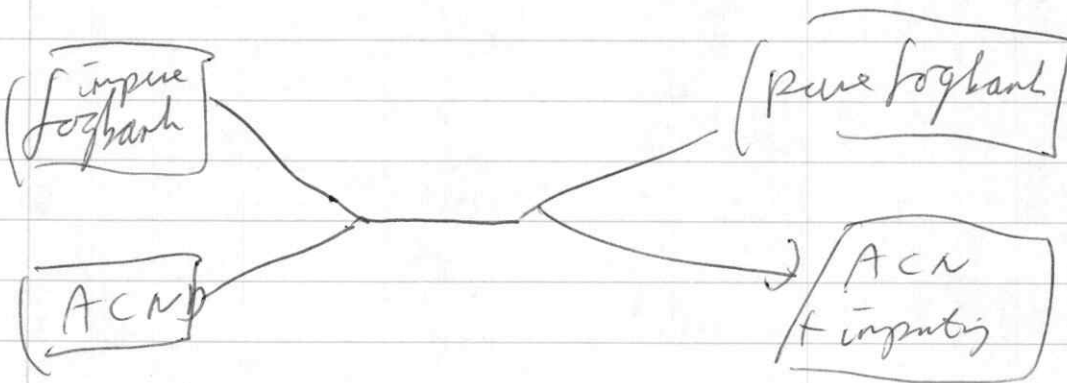
Does a sea breeze get rid of a fog bank or a ceiling?

'S. M. Lyndall says:  
- make sleep





1?



And FY 2005 - products margins of 13 products (prod sep + related costs)

FY 2005 - Missed-credit handling -  
 9201-1; 9201-5; 9201-SN; 9202, 9204-2E,  
 9204-a; 9206, 9212, 9215, 9720-5, 9995, 9998  
 (12 faults).

In 2002 also 9204-2

See below at DAP products

1978!