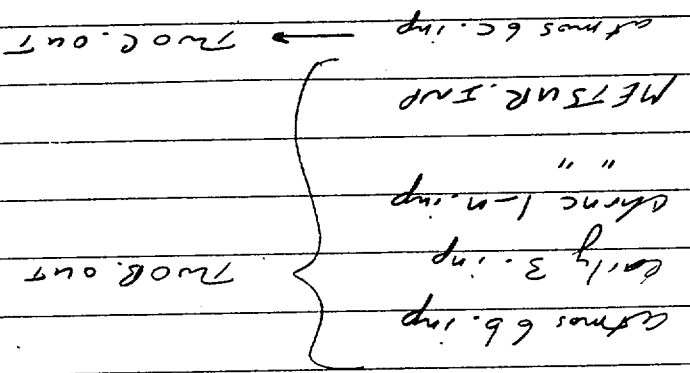


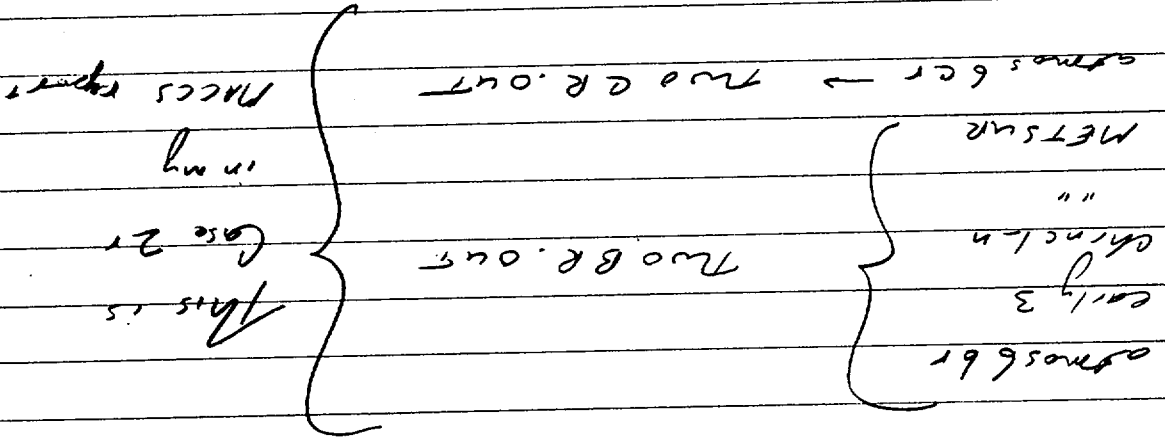
A. Comparison of NUREC/CR-4982

Case 2 => Two B. OUT



Revise from Susquehanna power level
back to Millstone 1 power level =>

atmos 6b.inp -> atmos 6b.inp



2/66

5/21/99

B. Comparison of NUREG/CR-6451

Need early fatalities at 50 miles for Case 3 =>

Case 3 ≡ 7B.OUT, 7C.OUT, 7D.OUT

atmos 7b.inp	}	7B.OUT
early 3.inp		
chrnc 1-n.inp		
METSUR.INP		
" "		

So add output for early fatalities at 50 miles =>

early 3.inp → early 3e.inp

atmos 7b.inp	}	7BE.OUT
early 3e.inp		
chrnc 1-n.inp		
METSUR.INP		
" "		

Distance Population

0-30 miles 1000 persons/mile²

30-50 miles city of 10 million, 280 persons/mile² elsewhere

50-500 miles 200 persons/mile²

⇒ higher everything

maybe 18x higher within 50 miles

maybe 2x higher within 500 miles

Exclusion Area

4 miles (.65 km) ⇒ lower per capita food intake

Amount of decay

12 days ⇒ 50% higher per capita food intake

Amount of long-lived isotopes

3x higher ⇒ up to 3x higher cancer fatalities and serious disease

Range Size

1150 Mw vs. Susquehanna () per capita food intake

$$\frac{\pi R^2}{0-30 \text{ miles} \rightarrow \pi (30 \text{ miles})^2 = 2827 \text{ miles}^2}$$

$$0-50 \text{ miles} \rightarrow \pi (50 \text{ miles})^2 = 7854 \text{ miles}^2$$

$$0-500 \text{ miles} \rightarrow \pi (500 \text{ miles})^2 = 785,400 \text{ miles}^2$$

$$\frac{0-30 \text{ miles}}{1000 \frac{\text{persons}}{\text{mile}^2} \times 2827 \text{ miles}^2 = 2.827 \times 10^6 \text{ persons}}$$

$$\frac{30-50 \text{ miles}}{280 \frac{\text{persons}}{\text{mile}^2} \times (7854 - 2827) \text{ miles}^2 = 1.332 \times 10^6 \text{ persons}}$$

+ city of $10 \times 10^6 \text{ persons}$

$$\frac{10 \times 10^6 + 1.332 \times 10^6 \text{ persons}}{7854 - 2827 \text{ miles}^2} = \frac{2554 \text{ persons}}{\text{mile}^2}$$

$$\frac{50-500 \text{ miles}}{200 \frac{\text{persons}}{\text{mile}^2} \cdot (785,400 - 7854) \text{ miles}^2} = 155 \times 10^6 \text{ persons}$$

$$\frac{0-50 \text{ miles}}{10 \times 10^6 + 1.332 \times 10^6 + 2.827 \times 10^6 \text{ persons} = 1800 \frac{\text{persons}}{\text{mile}^2}}$$

$$7854 \text{ miles}^2$$

$$\frac{0-500 \text{ miles}^2}{10 \times 10^6 + 1.332 \times 10^6 + 2.827 \times 10^6 + 155 \times 10^6 \text{ persons}} = \frac{215 \text{ persons}}{\text{mile}^2}$$

$$785,400 \text{ miles}^2$$

Societal Dose and Cancer Fatalities

Power correction of 3

atmos 7b.inp → atmos 7br.inp

Population density of 1800 persons/mile²

early 3e → early 3ea.inp

Population density of 215 persons/mile²

early 3e → early 3eb.inp

Case 3ra:	atmos 7br.inp	}	7BRA.OUT
	early 3ea.inp		
	chract-n		
	" "		
	METSUR		

Case 3rb:	atmos 7br.inp	}	7BRB.OUT
	early 3eb.inp		
	chract-n		
	" "		
	METSUR		

Case 3ra

Societal Dose 0-50 miles 389,000

Cancer Fatalities 0-5 miles 20,800

Case 3rb

Societal Dose 0-50 miles 57,900

0-500 miles 994,000

Cancer Fatalities 0-50 miles 3,050

0-500 miles 44,900

Overall

Societal Dose 0-50 miles \rightarrow 389,000

0-500 miles \rightarrow $389,000 + (994,000 - 57,900)$
 $= 1,330,000$

Cancer Fatalities 0-50 miles \rightarrow 20,800

0-500 miles \rightarrow $20,800 + (44,900 - 3,100)$
 $= 62,600$

5/23/99

7

Prompt Fatalities

<u>Excl Area</u>	<u>Pop. Density</u>	<u>Power Cor</u>	<u>Files</u>	<u>Early Fatalities</u>	
				<u>0-50</u>	<u>0-500</u>
0	1800 p/m ²	3	atmos 7br, early 3ea, 7bra.out	785	785
.32	1800 p/m ²	3	atmos 7br, early 3ec, 7brc.out	751	751
.32	1000 p/m ²	3	atmos 7br, early 3ed, 7brd.out	417	417
.32	1000 p/m ²	1.8	atmos 7bs, early 3ed, 7bsd.out	186	186
.75	1000 p/m ²	1.8	atmos 7bs, early 3ee, 7bse.out	159	159
.32	1000 p/m ²	1.7	atmos 7bt, early 3ed, 7btd.out	168	168
0	1000 p/m ²	1.7	atmos 7bt, early 3ef 7btf.out	183	183

Power Correction

Millsome 1 is 2006 MWe / 654 MWe

NUREG/CR-6451 is 1155 MWe

=> Power Correction is $\frac{1155}{654} = 1.8$

Exclusion Area

NUREG/CR-6451 is .4 miles

	<u>km</u>	<u>miles</u>
1 →	0	0
3 →	.52	.32
4 →	1.21	.75