

Name _____

Master UPC

EVALUATION:

- EMERGENCY OPERATION PROCEDURES
- SEVERE ACCIDENT MANAGEMENT GUIDES

Questions:	5
Points:	75
Time:	40 min

65,70/
75

20/20



QUESTION 1 [20 points 10 min]

CONTROL ROOM OPERATIONS

Using the procedure attached explain the actions to take by operators in the following cases:

a) Neutron flux - NOT DECREASING

Manually trip reactor. If reactor doesn't trip, go to
FR - S.1

b) All turbine stop valves - CLOSED

Go to next step: 3) Verify Power To AC Emerg. Busses:
2) AC emergency busses

c) AC emergency busses - ONE ENERGIZED

Verify AC emergency busses - ALL ENERGIZED ^{NO (only one)} ⇒ Try to restore power to deenergized AC emerg. busses.

d) SI - NOT REQUIRED

Go to ES-0.1 Reactor trip response, step 1.

e) SI - REQUIRED and ONLY ONE TRAIN ACTUATED

~~Verify both trains actuated~~ Verify both trains actuated ⇒ NO

Manually activate SI

- 1 **Verify Reactor Trip:**
 - Rod bottom Tights - LIT
 - Reactor trip and bypass breakers - OPEN
 - Rod position indicators - AT ZERO
 - Neutron flux - DECREASING

Manually trip reactor. IF reactor will NOT trip, THEN go to FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS, Step 1.

- 2 **Verify Turbine Trip:**
 - a. All turbine stop valves - CLOSED

a. Manually trip turbine.

- 3 **Verify Power To AC Emergency Busses:**
 - a. AC emergency busses - AT LEAST ONE ENERGIZED
 - b. AC emergency busses - ALL ENERGIZED

a. Go to ECA-0.0, LOSS OF ALL AC POWER, Step 1.

b. Try to restore power to deenergized ac emergency busses.

- 4 **Check SI Status:**
 - a. Check if SI is actuated:
 - b. Verify both trains of SI - ACTUATED

a. Check if SI is required. IF SI is required, THEN manually actuate. IF SI is NOT required, THEN go to ES-0.1, REACTOR TRIP RESPONSE, Step 1.

b. Manually actuate SI.

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QUESTION 2 [20 points 10 min]



EMERGENCY PROCEDURES

Describe the difference between Optimal Recovery Guidelines and Critical Safety Function restoration procedures.

The optimal recovery guidelines have less priority than the Critical Safety Function restoration procedures (if an orange or red light appears in any of the critical safety functions, ~~in that case~~ the operator ~~will~~ must follow the CSF ~~restoration~~ procedures to restore the CSF). with the following priority: subcriticality, core cooling, heat sink, RCS integrity, containment and RCS ^(inventory). The optimal recov. guidelines are used to recover normal plant conditions (cold shutdown in the case of an emergency) and it is symptom based.

CSF ensure barrier protection

7,5/10



QUESTION 3 [10 points 5 min]

EMERGENCY PROCEDURES

Describe wich of the following fission products barriers are protected by Each Critical Safety function

- a) *Fuel Matrix and Fuel Clad*
- b) *RCS Pressure Boundary*
- c) *Containment ~~Vessel~~ building*

ANSWER CHART:

Subcriticality (S)	a				
Core cooling (C)	a	b			
Heat sink (H)	a	b			
RCS integrity (P)	b	c			
Containment (Z)	b	c			
RCS Inventory (I)	b	c	a	b	

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QUESTION 4 [15 points 10 min]



EMERGENCY PROCEDURES

For each accident condition, state the behaviour (increase, decrease or constant) of the parameters within the first minutes of the accident:

NOTE: Answer "I" for increase, "D" for decrease and "C" for constant.

	REACTOR TRIP	LARGE LOCA	SMALL LOCA	MSLB	SGTR	ATWS (WITH LOSS OF FW)
RCS pressure	D	D	D	D	D	I
PZR level	D	D	D	D	D	I
SG pressure	D	I → C first seconds	D	D	I	D I
SG level	I → C first seconds	I → C I	C	D	I	D
Containment pressure	C	I	I	C	C	C
Containment radiation	C	I	I	C	C	C
Secondary circuit radiation	C	C	C	C	I	C

6,2/10

QUESTION 5 [10 points 5 min]



SAFETY ACCIDENT MANAGEMENT GUIDES

A set of actions considered in the SAMG is listed in a table below. Relate each one of them to the guide or guides in which they are executed.

Actions	SAG Guide
Depressurize containment	6, 7 5
Burn hydrogen	7
Operate containment heat sinks	6 6
Depressurize SG	1, 2
Pressurize containment	6 7
Operate auxiliary building ventilation	6 5

- SAG-1 : SG water injection
- SAG-2 : RCS depressurization
- SAG-3 : RCS injection
- SAG-4 : Containment injection
- SAG-5 : Fission products release control
- SAG-6 : Containment conditions control
- SAG-7 : Hydrogen containment concentration reduction
- SAG-8 : Containment Inundation