


How to Teach HP to End Users

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Dominion Virginia Power
March 2012

Four Pre-Job HP Questions


1) What Error Precursors exist here?

- Traffic?
- Fatigue?
- Darkness?
- Wrecked car?
- Unstable pole?




2) What errors are you most likely to make in this job?

- Hang Headway tag on wrong handle?
- Forget to communicate HV to rest of team?



3) What realistic worst case scenarios could occur?

- Induced voltage
- Incidental contact
- Unintended energization



4) What Human Performance tool(s) will you use to minimize each threat you just found, and when?

Threat	Tool	When
Induced voltage	Lockout	When entering workspace or pulling moving conductors
Incidental contact	Lockout	When entering workspace or pulling moving conductors
Unintended energization	Lockout	When entering workspace or pulling moving conductors

MOAB Switching Case

Revised
25 March 2012

This case study is intended only to foster thoughtful discussion and may not show correct technical procedure and may not be based on actual events. Consult your official resources and your Supervisor for correct policies and procedures. Names and details in this case may have been changed.



The Job

The HP Qs

**The
Incident**

**The HP
Analysis**

You are completing a switching order that includes closing this substation Motor Operated Air Break (MOAB) switch. You're qualified to switch MOABs, but have not operated one for more than a year, and are rusty. You have no MOAB manual. Your System Operator is very familiar with MOABS and will stay on the phone with you throughout the procedure.





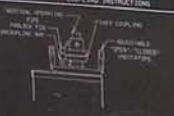
Coupled or decoupled?







VIRGINIA POWER
NORTH CAROLINA POWER
TYPE NO-18 MOTOR OPERATOR
COUPLING INSTRUCTIONS



IN THE COUPLED POSITION THE PULLDOWN PIN IS USED TO HOLD THE SWITCHING ARM FLAT TOGETHER WITH THE FEED COUPLING AS SHOWN ABOVE.

TO UNCOUPLE THE NO-18 MOTOR OPERATOR FROM THE SWITCHING ARM, WITHDRAW THE PULLDOWN PIN, LIFT THE SWITCHING ARM AND SECURE THE COUPLING ARM TO THE "OPEN" OR "CLOSE" POSITION AS SHOWN BELOW.

Common
alignment
problem... and
solution?

4M

H5

4M

The Job

The HP Qs

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Analysis**

With the person next to you, spend 4-7 minutes answering the **Four Human Performance Pre-Job Questions** for this case.

Write down key words for each answer.

Prepare to share with the group.



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1) Precursors (aka Error Multipliers)

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Threat	Tool	When
Induced voltage	Lockout/Tagout (LOTO)	When working on energized equipment or pulling moving conductors
Incident	Personal Protective Equipment (PPE)	When working on energized equipment or pulling moving conductors
Unintended operator	Communication	When working on energized equipment or pulling moving conductors


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- Operate wrong device
- Miss a step in switching (or prepping MOAB)
- Coupling the device improperly

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4) What defenses will you use to minimize the hazards above?

- Get an experienced switchman on site
- Share operating experience

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- Get an experienced switchman on site
- Share operating experience
- Confirm Terminology
- Three-way communication

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3) Worst case scenario

- Unintended operation

4) What defenses will you use to minimize the hazards above?

- Get an experienced switchman on site
- Share operating experience
- Confirm Terminology
- Three-way communication
- Peer Check/Self-check
- Stop when unsure & question what doesn't make sense

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**The
Incident**

**The HP
Analysis**

What Actually Happened

Insert audio of recording between switchman and System Operator after sterilizing names, identifiable info, and after digitally disguising voices.



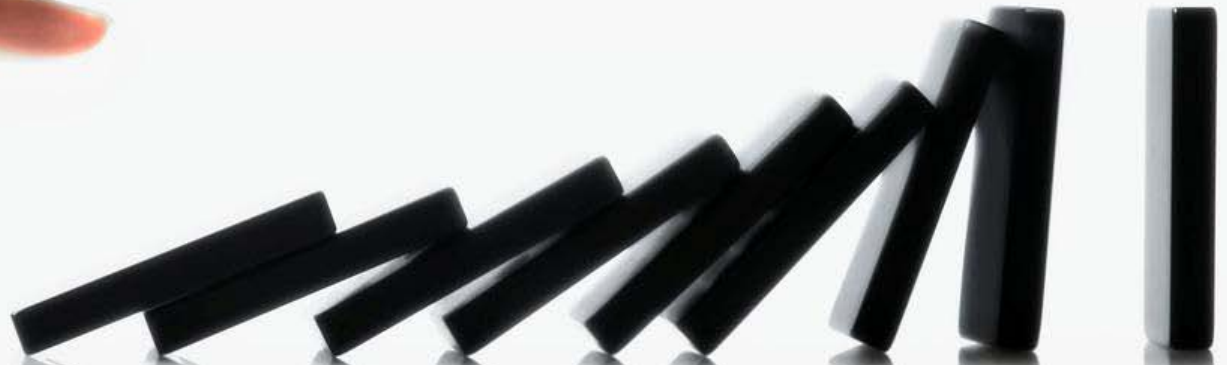
The Job

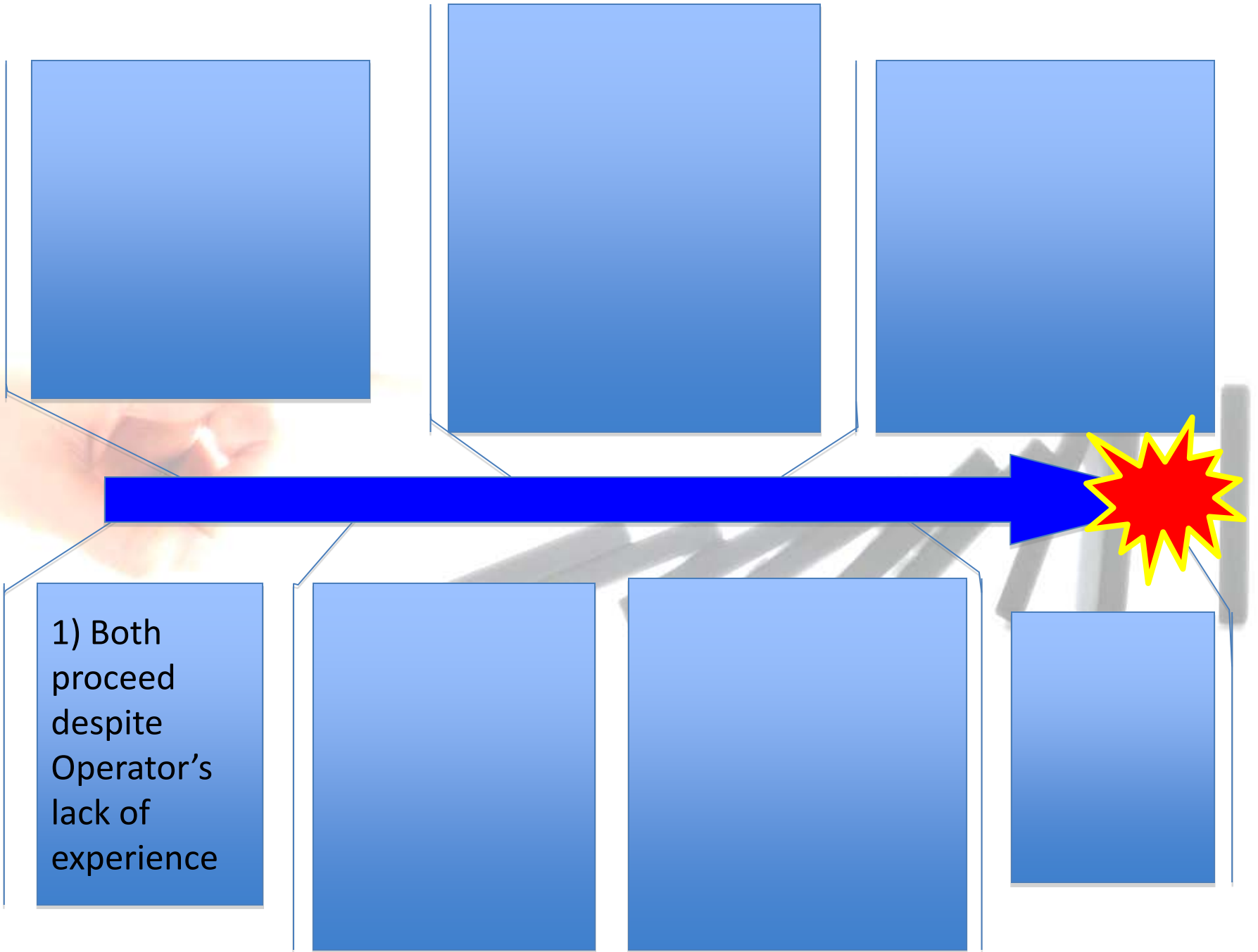
The HP Qs

**The
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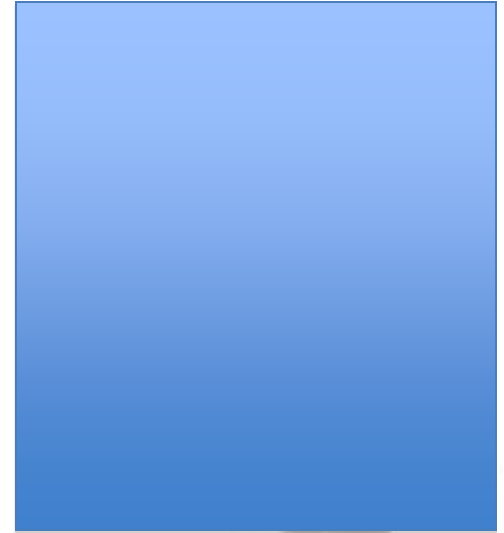
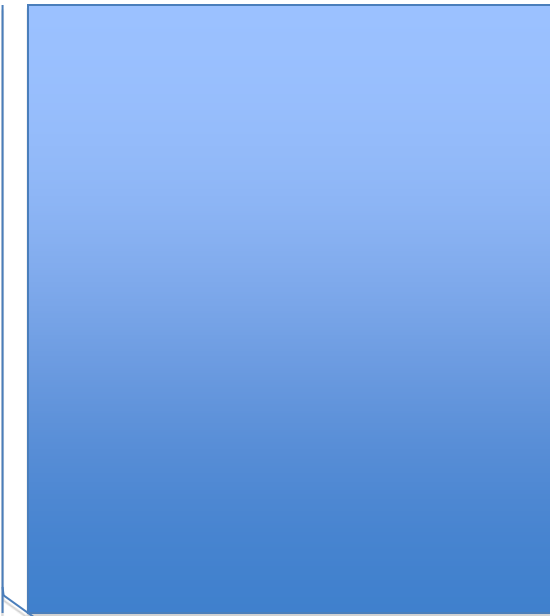
**The HP
Analysis**

In the next 12 minutes, with the person next to you, identify the 5-7 specific causal factors that cascaded together to cause this incident.

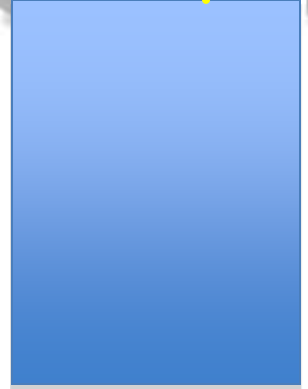
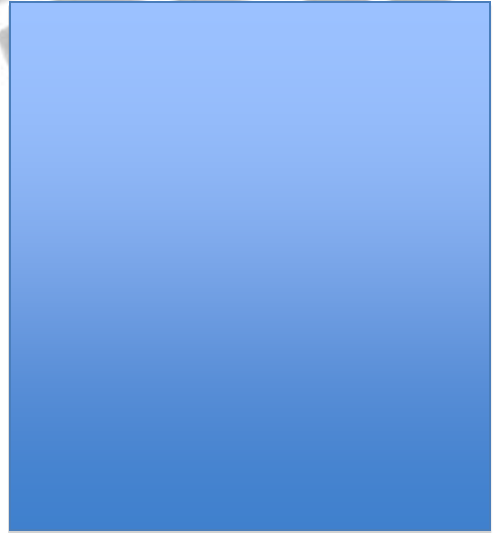
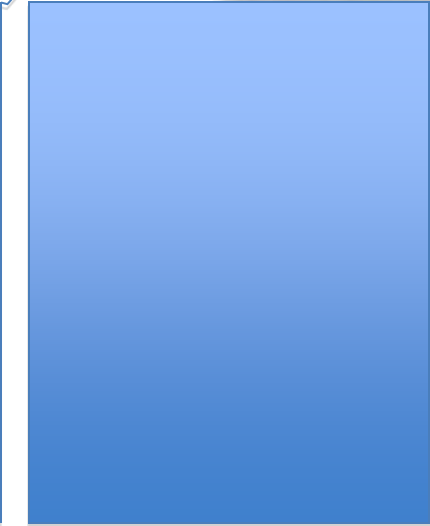


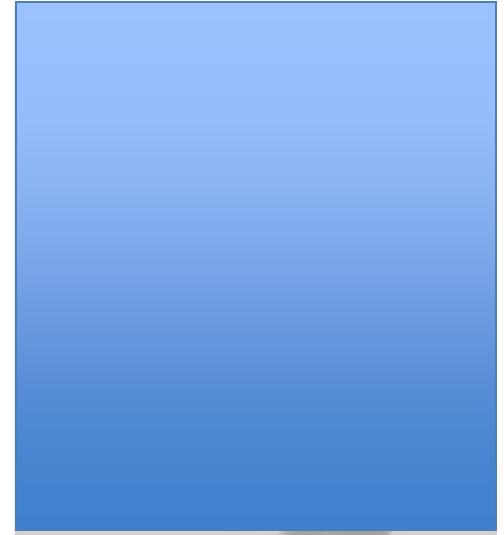
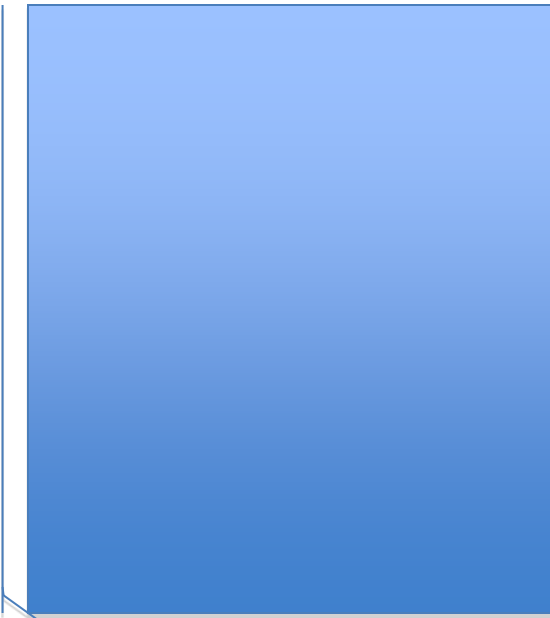


1) Both proceed despite Operator's lack of experience

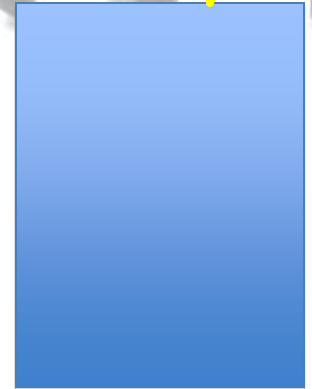
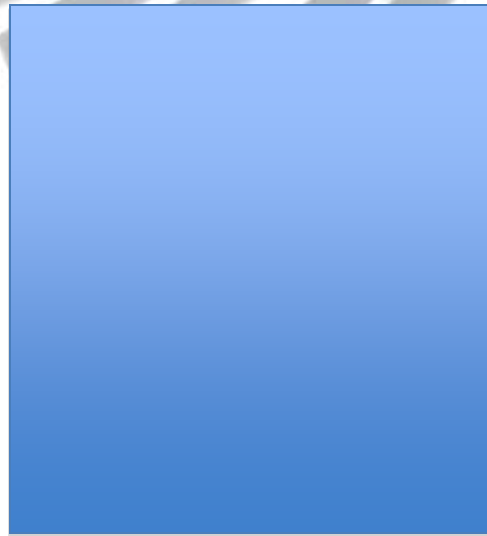


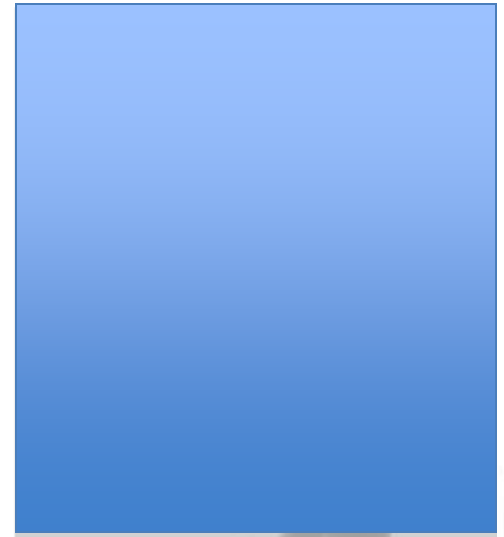
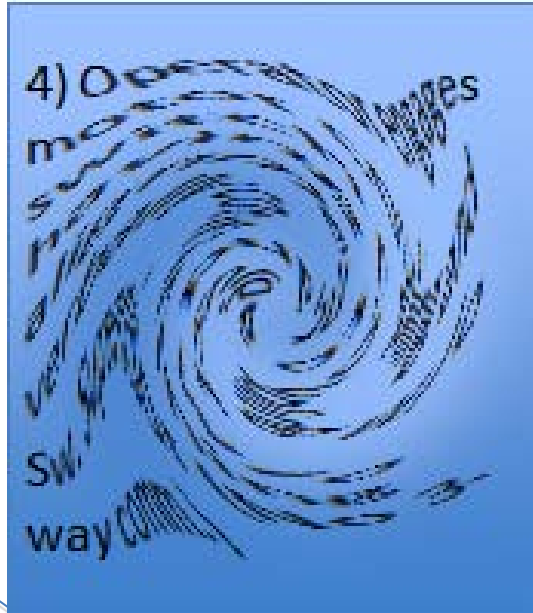
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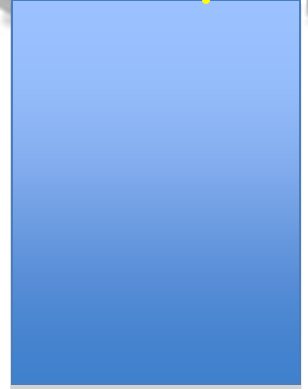
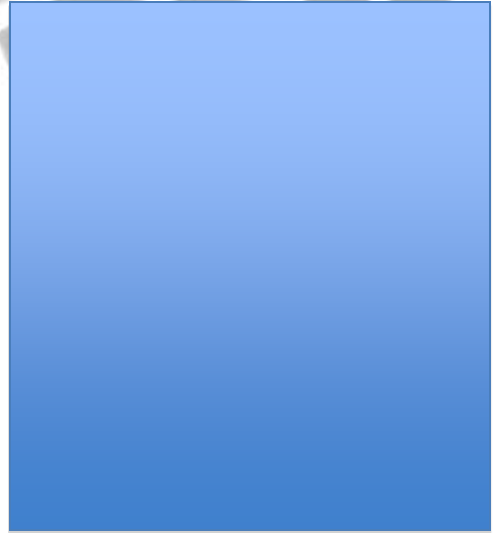


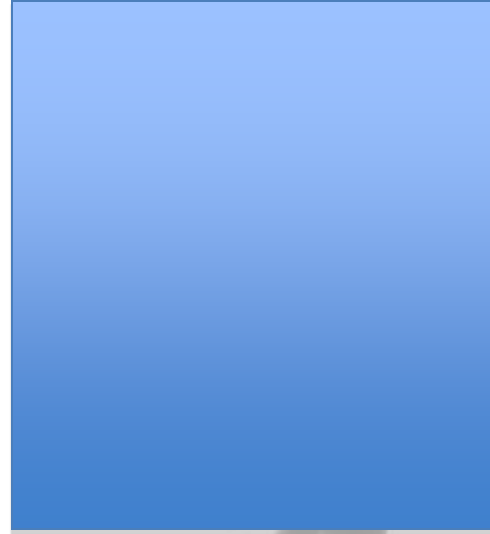
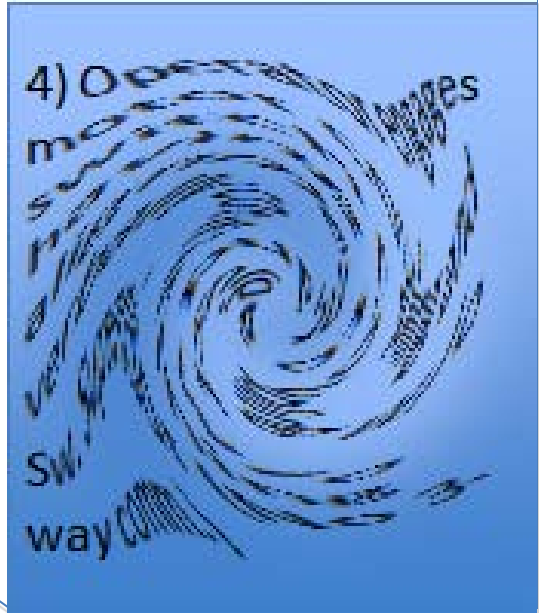
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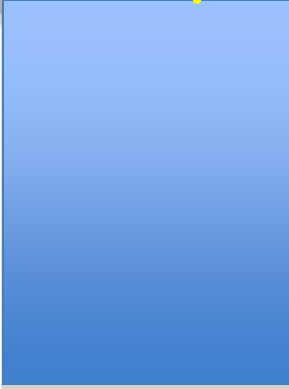


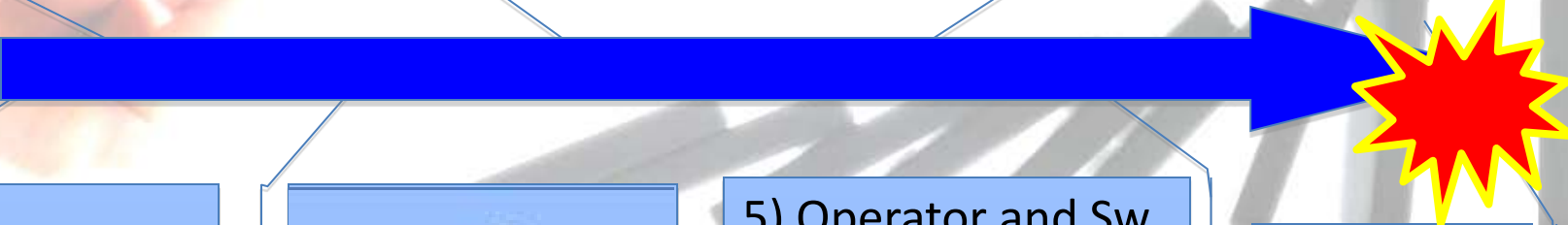
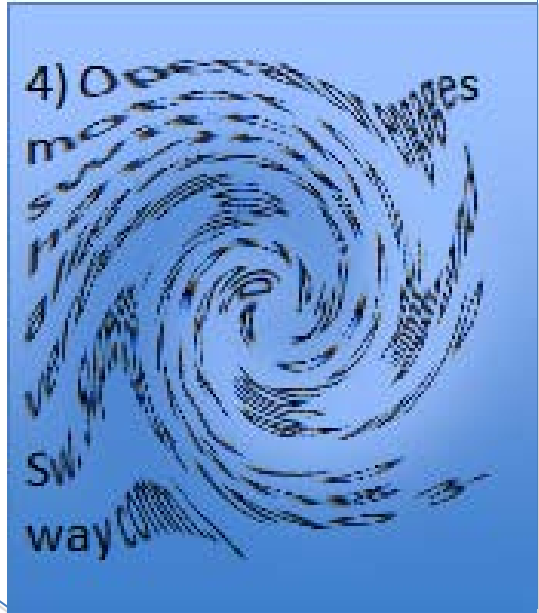


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5) Operator and Sw. Supervisor misunderstand each other's use of terms "engage" and/or "couple" (No confirmation of terminology)

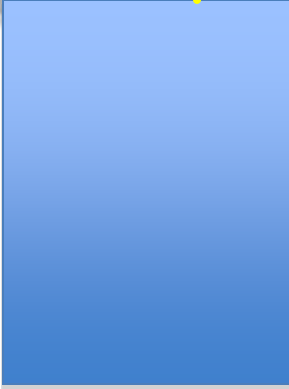


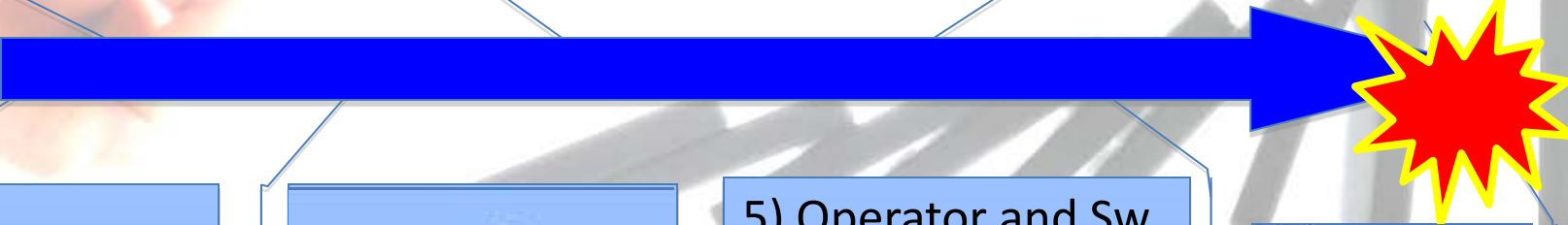
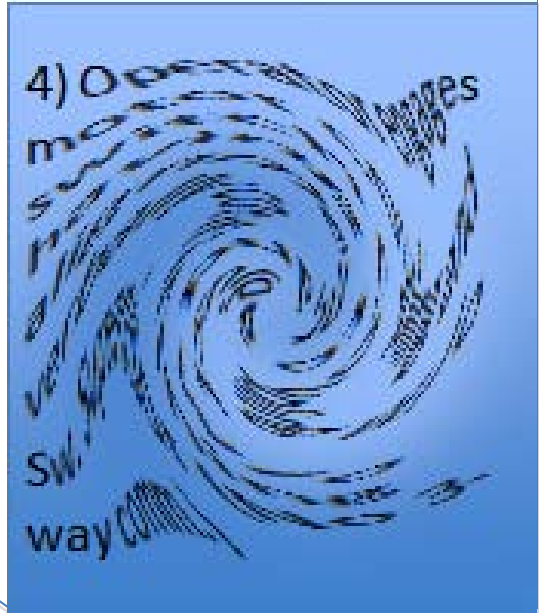


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How to Build & Lead an Interactive Case

1. Chunk case into four 'chapters'



2. Event = _____ years old
3. Use your _____
4. Show, don't tell – use _____
5. 90% of good writing is _____
6. Get critique from _____
7. Design slides for _____

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