

ATTACHMENT C

Critical Decision Method (CDM) Semi-Structured Interview Guide

Subject ID: _____

Interviewer: _____

Date: _____

Demographics

1. Job title _____
2. Number of years mining experience _____
3. Number of years at this mine site _____
4. Number of years of haul truck operating experience (total) _____
5. Number of years of haul truck operating experience (at this site) _____

Reminder: To help protect identifiable information, please avoid using the names of individuals or specific work locations. For example, in describing an operator of another vehicle, use the term “operator” or “driver”. When describing a work location use generic terms such as haul road or shop area and avoid using specific names such as “Cochran’s Mill Road”.

Note: The purpose of the CDM interview is to gain an understanding of how operators respond in challenging or non-routine scenarios and gain a greater depth of knowledge about these specific scenarios. The researchers will ask operators to talk us through a particularly challenging event from their own experience, describe the event on a timeline, highlight critical decision points, and elicit cues that helped them make sense of and respond to the situation. An example of a challenging event may be a near miss, a collision involving property damage, or loss of control due to environmental conditions.

The CDM occurs in four “sweeps,” which means, four retellings of the same incident with varying levels of detail: (1) Incident Identification, (2) Timeline Verification, (3) Deepening, and (4) “What If” Queries.

Sweep 1: Incident Identification

Goals

1. Obtain and Incident
2. Ask for an Overview

Activities

Identify an incident that 1) that requires cognitive effort, that 2) forced the participant to use cognitive effort to go beyond background and routine procedural knowledge of the domain, and that 3) enables us to learn about skilled performance during an event. The incident should be complex enough to reveal expert level decision making.

Question Protocol

1. I'd like to ask you now to think of a specific incident or situation that you were directly involved in that sticks out in your mind as particularly challenging, risky, difficult or overwhelming. It's important for this section to think of the right kind of incident and go into some detail, so we may reveal several and choose one to focus on.
2. With that in mind, can you think of a time when you and your skills were especially challenged?
3. If so, describe the incident, give me the basic details.
4. Can you think of an incident when your skills really made a difference? One in which things would have gone very differently if you weren't there?

Notes

Sit quietly. Don't rush or lead them too much. Listen for the pauses, narrative changes and shifts.

Verify the Incident

The answer should be "yes" to all the following for a good incident.

1. Was this a rare event?
2. Was the event non-routine?
3. Was it high stakes?
4. When were you scared/overwhelmed?
5. Did it challenge you to go above and beyond typical skills requirements?
6. Did you have a role as an operator/decision maker in the event?
7. Did your decision making have a direct impact on the outcome?

Sweep 2: Timeline Verification

Goals

1. Repeat back the incident
2. Construct a timeline or diagram
3. Record decision points, shifts in understanding, and major events
4. Ask clarifying questions

Activities

In sweep 2, we verify the timeline by diagramming it with the participant.

1. Walk participant through the timeline, indicating the full duration of the incident.
2. Draw out the events, actions, perceptions, thoughts, and decisions and place them on the timeline.
3. Identify critical decision points where the participant experienced a major shift in his or her understanding of the situation or took some action that affected the outcome.
4. Allowing the participant to see what we're doing and make corrections.
5. Reaffirm the timeline often to ensure a shared, agreed upon view of the facts from the participant's perspective.
 6. Pay close attention to the major decision points, shifts in how they are making sense of the situation, gaps in the story, anomalies, surprises, errors, ambiguities and complexities.

Question Protocol

1. Let's begin by identifying the major critical events. We're going to lay this out in linear order, let's start at the beginning.
2. What was going on in your mind when (specific element) occurred?
3. Where on the timeline should I put this (specific element)?
4. Do I have this right?
5. What were the most challenging elements for you? For the team?
6. What were some of the major decisions that contributed to making the incident worse?
7. What were the critical decisions that helped solve the problem?
8. Do I have this right?

Notes

This process should not be influenced by the interviewer, nor by the standard protocol or what "should" have happened.

Sweep 3: Deepening

Goals

1. Ask questions until you understand the incident
2. Use the timeline for clarification
3. Repeat back confusing points

Activities

This is the heart of the interview. After verifying the timeline, we go deeper than the time elements and basic facts of the incident, probing about the expectations participant's perceptions, expectations, goals, judgments, confusions, and uncertainties about the incident as it unfolded. One of the primary things here is to identify: *how did they know something was wrong? How did they react? How did they make sense of it?*

Question Protocol

1. What was it about the situation that let you know what was going to happen?
2. What was it about the situation that let you know what to do?
3. What led you to make the decisions that you made?
4. How were decisions being communicated?
5. What were your primary concerns at this point?
1. What other options did they consider in making decisions?
2. What information did you need and how did you get it or fail to get?

Overlay additional segments of the incident and key decision points on the timeline.

Gathering Additional Cues (all optional depending on what is being shared)

1. What were you seeing, hearing, smelling, noticing etc.?
2. What information did you use in making this decision or judgment?
3. How and where did you get this information, and from whom?
4. What did you do with the information?
5. Were you reminded of any previous experience?
6. What about that previous experience seemed relevant for this case?
7. Does this case fit a standard or typical scenario?
8. Is it a type of event you were trained to deal with?
9. What were your specific goals and objectives at the time?
10. What was most important to accomplish at this point in the incident?
11. What other courses of action were considered or were available to you?
12. How was this option chosen or others rejected?
13. Was there a rule that you were following in choosing this option?
14. What specific training or experience was necessary or helpful in making this decision?
15. Suppose you were asked to describe the situation to someone else at this point. How would you summarize the situation?
16. Did you imagine the possible consequences of this action?
17. Did you create some sort of picture in your head?
18. Did you imagine the events and how they would unfold?
19. What let you know that this was the right thing to do at this point in the incident?
20. How much time pressure was involved in making this decision?
21. How long did it take to actually make this decision?
22. Did you seek any guidance at this point in the incident?
23. How did you know to trust the guidance you got?

Notes

Always keep it in first person, from their experience. Pay special attention to when they say things like “I just knew...” or “something didn’t feel right...” or “My gut told me...” These are indications of expertise at work – decisions made outside of conscious awareness.

Sweep 4: “What If” Queries

Goals

1. Use “what if” questions to tease out specific elements
2. Ask what a new person might have done

3. Ask what mistakes might have been made earlier in their career in the same situation

Activities

We start at the beginning of the incident again and pose hypotheticals about the situation. The purpose here is to get alternatives to have them tap into their expertise to outline what could have been done differently, how things could have gone differently, what missing factors contributed to the incident or what available factors helped minimize negative consequences.

Question Protocol

1. How could things have gone differently?
2. How could the outcome have been changed?
3. How could you have changed the outcome?
4. If someone more novice than you were in charge at this point, what type of errors would they have made? What don't they know that you know? Would they have known to do X?
5. If [insert key feature] of the situation had been different, what impact would it have had on your decision/assessment/actions/plan?
6. What training might have offered an advantage in this situation?
7. What knowledge, information, or tools/technologies could have helped?

Notes

Pay special attention when participants say things like. "If only we had..." or "If only someone would have done..." or "If only I knew how to..."