

UNDERSTANDING THE PROBLEM (Steps 1 & 2)

Tool	Purpose	Strengths / Advantages	Weaknesses / Difficulties
Flowchart (process map)	Understand the flow of activities in a process and interrelationships between processes	<ul style="list-style-type: none"> Focuses on linkages and hand-offs between functions, job titles, etc. Uses graphics 	<ul style="list-style-type: none"> Difficult to decide on the level of detail Do not have the level of detail found in procedures May be of limited value if a process is seriously out of control
Direct observation	Determines the current level of compliance with requirements as process steps are completed	<ul style="list-style-type: none"> Helps with understanding the process and work flow Provides additional information not included in the NCE report 	<ul style="list-style-type: none"> Can be intimidating and confused with blame
Document review	Understand the requirements of the process	<ul style="list-style-type: none"> Explains how things are supposed to happen Describes the requirements and expectations of the organization 	<ul style="list-style-type: none"> May not be adequate or correct May not exist May not be easy to understand
Record review	Verify the outputs of defined criteria	<ul style="list-style-type: none"> Provides verification of completed tasks Provides objective evidence when requirements are unfulfilled 	<ul style="list-style-type: none"> May not be accessible May not be complete or provide sufficient detail
Interview	Providing a forum for process owners to describe documented and undocumented practices and to provide details of what happened	<ul style="list-style-type: none"> Helps with understanding the process and work flow Provides additional information not included in the NCE report May be the only source of information about a process 	<ul style="list-style-type: none"> Relies on people's time and availability Often subjective Can be intimidating and confused with blame
Photographs	Captures a visual snapshot of the problem	<ul style="list-style-type: none"> Communicates complex information at a glance 	<ul style="list-style-type: none"> May need permission Depending on the context, may be difficult to note the scale Viewpoint may change depending on angle or perspective
Pictogram	Creates a visual that allows representing the spatial orientation of a problem's symptoms (e.g. floor plan, picture of a body to locate injuries)	<ul style="list-style-type: none"> Emphasizes the spatial factor 	<ul style="list-style-type: none"> May not be applicable to the problem

IDENTIFY THE POSSIBLE CAUSE (Step 3)

Tool	Purpose	Strengths / Advantages	Weaknesses / Difficulties
Brainstorming	Generate as many ideas as possible in a creative exercise	<ul style="list-style-type: none"> ▪ Uncovers causes that would otherwise be ignored or missed ▪ Involves many people 	<ul style="list-style-type: none"> ▪ One or few people can dominate ▪ No anonymity is possible ▪ Undervalued because it is fun
Brainwriting	Generate as many ideas as possible	<ul style="list-style-type: none"> ▪ Involves many people ▪ Enables anonymity 	<ul style="list-style-type: none"> ▪ Can be less spontaneous than brainstorming
Process Step Variation	Brainstorm variations that may occur at each step of the failed process that caused the problem	<ul style="list-style-type: none"> ▪ Focuses on the failed process involved with the NCE 	<ul style="list-style-type: none"> ▪ The scope of the problem may be poorly defined ▪ The boundaries of the process may be poorly defined
Logic tree analysis (WHY – WHY diagrams; abbreviated fault tree analysis)	Graphically display branches of cause-and-effect relationships	<ul style="list-style-type: none"> ▪ Creates insight into how causes interact ▪ Easy to use 5 WHYS to dig deeper in a branch 	<ul style="list-style-type: none"> ▪ If numerous causes occur on many levels, the diagram may be difficult to construct and read
Cause-and-effect diagram (Fishbone, Ishikawa Diagram)	Generate and group problem causes	<ul style="list-style-type: none"> ▪ Promotes structure and creativity 	<ul style="list-style-type: none"> ▪ Requires more training than other tools to be useful
5 WHYS	Identify chains of cause-and-effect by tracing back the sequence of events that led to the NCE	<ul style="list-style-type: none"> ▪ Finds the root cause ▪ Uncovers causes that would otherwise be ignored or missed 	<ul style="list-style-type: none"> ▪ Requires some creativity and deep knowledge of the problem ▪ Of limited value if there are multiple causes contributing to the problem
Is-Is not Matrix	Generate ideas about the problem, focusing especially on what does and does not characterize it	<ul style="list-style-type: none"> ▪ Separates clearly between effects that do and don't occur ▪ Allows to see contrasts and odd issues more clearly 	<ul style="list-style-type: none"> ▪ Can be difficult to generate <i>is not</i> elements

COLLECT AND ANALYZE EVIDENCE TO CONFIRM OR DENY EACH CAUSE (Step 4)

Tool	Purpose	Strengths / Advantages	Weaknesses / Difficulties
Sampling	Gain a representative from a large population	<ul style="list-style-type: none"> Minimizes the data collection effort 	<ul style="list-style-type: none"> Difficult to decide on the type of sampling and sample size The samples chosen may not be representative
Surveys	Collect data from respondents	<ul style="list-style-type: none"> Allows collection of large amounts of data 	<ul style="list-style-type: none"> Good surveys are difficult to design Often low response rate
Tally sheet	Register data in a systematic way	<ul style="list-style-type: none"> Easy to use Ensures that all data are captured 	<ul style="list-style-type: none"> Data categories not specified may be overlooked
Histogram	Portray data graphically	<ul style="list-style-type: none"> Easy to see patterns Uses graphics 	<ul style="list-style-type: none"> Difficult to determine data categories
Pareto chart	Graphically depicts the quantification of problems and their causes (i.e. the few elements causing the most effects)	<ul style="list-style-type: none"> Helps to identify significant causes to known problems or NCEs 	<ul style="list-style-type: none"> Multiple axes in same chart
Scatter Plot (Comparison chart)	Find relationships between 2 variable like outcome improvement and effective solution implementation	<ul style="list-style-type: none"> Easy to comprehend graphics 	<ul style="list-style-type: none"> Difficult to select the independent and dependent variable

Flowchart – Refer to the job aid entitled, *Diagramming Processes*.

Direct Observations – Process observations should be planned for by studying the related standards and requirements. Look for near misses during the observation as an indicator that the process almost failed but the individual caught and corrected it in time while being observed.

Document Review - If the documents are not correct, the system will always have problems. Document issues go beyond correctness. Access, distribution, adequacy, timely removal of obsolete copies are all document issues.

Records Review- Because records document activities or results of activities, look for evidence of what occurred. Knowing specifically what you are looking for in advance will save time during the records review. When reviewing records for causes, know what causes are being evaluated and how they would show-up in the records. A tally sheet may be helpful during the review.

The Steps in Interviewing

I. Prepare for the interview

- Review any data previously collected
- Write questions down to keep the interview of track and are sensitively worded and nonthreatening
- Determine how you will record notes
- Plan on talking only 15-20% and listening 80-85%
- Plan to answer common interviewee's questions
 - Why do you want to talk to me?
 - What will you do with what I tell you?
 - Will my name be used?
 - How long with this interview take?
- Determine location for privacy and lack of interruptions
- Interview one person at a time.

II. Open the interview

- Greet the interviewee
- State the purpose of the interview
- Answer interviewee's questions (See Step I)
- Consider requesting the interviewee to write-down what they remember about the situation before asking any of your questions. This allows a more free flow of information from the brain, unfiltered by the your questions. This free flow can be used to supplement questions you plan to ask

III. Conduct the interview

- Encourage the interviewee to tell their story without questions or interruption. If they don't remember the day in question, then ask them *How do you normally do it?* This way you can avoid when employees report that they were conscientiously following procedure when the error occurs – when the facts are possibly quite different because they do not feel safe.
- Avoid questions that have *yes* or *no* answers (closed question)
- Encourage the interviewee to confine their comments to what they observed, avoid hearsay and avoid comments not in their personal knowledge or experience.
- Avoid leading questions which unintentionally tells the interviewee how to respond and make it difficult for them to answer honestly (e.g. I suppose the result was called immediately, wasn't it?)

IV. Close the interview

- Check to make sure that all necessary information has been obtained, if not, ask the final questions
- Ask the interviewee if they have any further comments or questions
- Ask if there is anyone else who has insight into the problem
- Thank the interviewee and invite them to contact a team member with additional information if necessary.

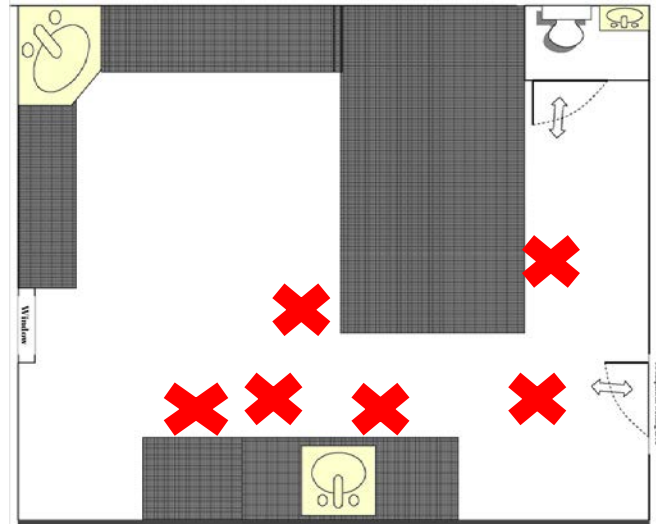
V. Complete the documentation and analysis

- Finalize your notes so that anyone else reviewing your interview can understand what transpired
- After verifying records, determine if they know the right way to do it (**Human Error** – yes they know OR **Competency Issue** – no they do not)

Photographs – Refer to the table portion entitled, *Understanding the Problem*.

Pictograms- Symbols are used to represent a concept, object, activity, place or event by illustration. It is a form of writing in which ideas are transmitted through drawing. Different symbols and colors can be used to add more information. When there is a spatial component to the problem, the pictogram may provide the insight the RCA team needs. Consider using a pictogram to:

- Map the locations where process steps are performed;
- Map the frequency of occurrences within a physical space.



The Steps in Brainstorming

1. Explain the rules
 - Do not discuss, criticize, or evaluate ideas during the brainstorming session .
 - Hunches are acceptable and no proof is needed.
 - All ideas are accepted during this process, the filtering of ideas will come later.
2. State the situation or problem referring to the substantiating evidence (e.g. This is what we know....).
3. Post the topic and known facts on a flipchart or whiteboard so that people can refer to them.
4. Allow participants to launch ideas according to the type of approach used.
 - Structured – each person in turn launches one idea. This approach ensures equal participation, but is less spontaneous and may limit the possibility of building on one another’s ideas.
 - Unstructured – everyone freely launches ideas and enables the building on one another’s ideas . This approach is very spontaneous, but it is often more confusing and can lead to one or more persons dominating the activity.
5. Write down every idea launched.
6. Allow the flow of ideas to stagnate once because the launching on more ideas will usually pick-up again.
7. Close the process when new ideas are only a reformulation of previously launched ideas or few new ideas are evident.
8. Narrow the causes to the most significant since not all these causes are of equal importance. Some of them will be outlandish in the spirit of brainstorming, and some will only be loosely connected to the problem.
9. Combine and group the remaining ideas. Consider grouping the ideas using a Cause-and-effect diagram. This will help identify what is needed for the next step, the collecting of evidence., by highlighting what documents and records to review, what to observe, what to measure, and who to interview.

Brainwriting Instead of launching (shouting out) possible causes, the causes are written by the participants, This approach is useful when the topic is of a sensitive nature or the anonymity of the participants must be protected. The only difference between brainstorming and brainwriting is in the way ideas are recorded. 2 ways to record the ideas are presented as follows:

1. Ideas are written on a number of whiteboards or flipcharts. The participants circulate among them, adding related ideas or expanding on the existing ideas.
2. Ideas are written on small cards and circulated among participants, who add related ideas or expand on the existing ones.

