

## Purpose

To structure and standardize the evaluation of leadership Decision Aids meant to be used during emergency situations.

## Problem

In an emergency, executives and incident commanders must make a number of decisions quickly. Sometimes, the right things to do in a disaster situation are counter-intuitive and hard to remember. Checklists and decision aids have been shown to help in these situations – but they must be designed properly for the emergency environment. In addition, leadership aids cannot be as prescriptive as standard checklists, since leaders will have to improvise due to the unpredictable nature of an emergency.

## Goals/Mission

This tool provides a set of research-based criteria to measure the usefulness of a Decision Aid during an emergency. It would be nearly impossible for any particular Decision Aid to meet all of these criteria, but having the metric gives us a way of measuring progress toward that ideal.

## Three Critical Questions

A Decision Aid needs to answer three critical questions to be useful during an emergency situation.

### **First, does the Decision Aid contain the right information about what needs to be done to manage the response?**

To answer this question, the tool evaluates whether the content of a given Decision Aid helps an executive or incident commander meet Quarantelli's ten evidence-based criteria for good disaster management (Quarantelli, 1997).

### **Second, does the Decision Aid give guidance to the leader on how to provide the best leadership during the response?**

Leadership behavior correlates strongly with team performance in stress conditions. For this factor, the tool evaluates Decision Aids against Gary Yukl and team's hierarchical taxonomy of leadership behavior (Yukl, Gordon, & Taber, 2002). This is a standard, validated taxonomy used to measure the presence of leadership behavior in organizations.

### **Finally, does the Decision Aid reflect best practices for usability in an emergency situation?**

This is critical to help ensure that the Decision Aid will be utilized. The design of the Decision Aid must be responsive to the first two questions (contain the right information, provide leadership guidance) and be appropriate for the environment in which the aid is to be used. The tool contains a list of criteria built from the work of NASA's *Emergency and Abnormal Situations Project*, led by Dr. Barbara Burian (B. Burian, Barshi, & Dismukes, 2005; B. K. Burian, 2004, 2006a, 2006b; B. K. Burian, Dismukes, & Barshi, 2003), combined with several other studies on checklist usability during emergencies, which are cited as they occur throughout the tool.

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# Evaluation Criteria

## A. Disaster Management – The “What”

Does the Decision Aid give guidance on **What** the executive needs to do to successfully manage the incident? These criteria are from Quarantelli (1997) and are based on research about what is needed to successfully manage an emergency response.

#	Criteria
<b>Does the Aid provide guidance on:</b>	
A1	Recognizing the difference between agent [e.g. scenario-based] and response generated [i.e., all-hazards] needs and demands?
A2	Carrying out generic functions? (Some generic functions common to all disasters: warnings, evacuation, sheltering, emergency medical care, search and rescue, and protection of property.)
A3	Mobilizing personnel and resources?
A4	Task delegation and division of labor for the response? (This should include both standard tasks and anticipate new tasks that have no clear owner. Should assume new organizations will appear and some current ones will have expanded roles.)
A5	Processing a huge amount of information? (Includes managing information flow within every responding organization; between organizations; from citizens to organizations; and from organizations to citizens.)
A6	Facilitating decision making AND solving these four common problems?
A6.1	(1) loss of higher echelon personnel because of overwork;
A6.2	(2) conflict over responsibility regarding new disaster tasks;
A6.3	(3) clashes over organizational domains between established and emergent groups;
A6.4	(4) surfacing of organizational jurisdictional differences.
A7	Developing overall organizational coordination? (Should emphasize mutually agreed on cooperation over command and control, connecting with private sector, collaborating on new tasks, and a willingness to de-emphasize organizational claims of leadership and territorial demands by stressing actions necessary for the greater community good.)
A8	Integrating tactics or groups that emerge spontaneously during a disaster (either from citizens or within organizations) with established ones? (Should support and facilitate rather than discourage emergent groups and strategies)
A9	Providing the mass communication system with appropriate information? (Should emphasize cooperative relationships with media, provide accurate information and take social media into account)
A10	Having and utilizing a well-functioning Emergency Operations Center (EOC) for the jurisdiction (not a particular agency)? (Should cover deployment of knowledgeable decision-makers as liaisons, not low level staff and using EOC to solve vertical/horizontal organizational differences).

## B. Emergency Leadership – The “How”

Does the Decision Aid address **how** the Executive will accomplish each of the following? These criteria are from Yukl et al. (2002) and represent a taxonomy of leadership behavior based on a half-century of research in the field. A few may seem “soft” for an emergency, but that’s when good leadership matters most.

#	Criteria
<b>Does the Aid help leadership to:</b>	
B01	Clarify roles? (i.e., assigning tasks and explaining job responsibilities, task objectives and performance expectations).
B02	Monitor operations? (i.e., checking on the progress and quality of the work, and evaluating individual and unit performance)
B03	Conduct short-term planning? (i.e., determining how to use personnel and resource to accomplish a task efficiently, and determining how to schedule and coordinate unit activities effectively.)
B04	Consult as needed? (i.e., checking with people before making decisions that affect them, encouraging participation in decision making, and using the ideas and suggestions of others.)
B05	Support staff? (i.e., prompt leaders to act considerate, show sympathy, and providing encouragement.)
B06	Recognize staff? (i.e., prompt leaders to provide recognition for effective performance and significant achievements.)
B07	Develop staff? (i.e., prompt leaders to provide coaching and opportunities for skill development (such as running new operations).)
B08	Empower staff? (i.e., prompt leaders to trust people to solve problems and make decisions without getting prior approval.)
B09	Envision change? (i.e., prompt leaders to present an appealing description of desirable outcomes that can be achieved.)
B10	Take risks for positive change? (i.e., prompt leaders to take personal risks and make sacrifices to encourage and promote desirable change.)
B11	Encourage innovative thinking by staff? (i.e., prompt leaders to challenge people to question their assumptions about the work and consider better ways to do it.)
B12	Monitor the external situation? (i.e., prompt leaders to analyze information to identify threats and opportunities for the response.)

## C. Design and Content Factors

Does the Decision Aid meet the following stipulations regarding its design and content, culled from a variety of studies on the use of checklists and decision aids?

**Note:** Major factor list from B. K. Burian (2011) with criteria sourced as cited.

#	Criteria
C1	<b>Physical Properties, Interface, and Integration: Size, weight, materials (type of paper, plastic, etc.), integration with displays &amp; alerts, etc.</b>
C1.1	Are the physical size, structure, and materials appropriate for the situations and the ways in which the Aid is intended to be used? (B. K. Burian, 2011)
C1.2	Are titles for Aids/Sections matched to other signals like alerts or warnings? (B. K. Burian, 2006b)
C1.3	Does the binding allow for replacement pages to be inserted easily by hand whilst being secure enough to prevent pages becoming loose? (Authority, 2006)
C1.4	Is the cover robust and able to withstand normal handling and cleaning? (Verdaasdonk, Stassen, Widhiasmara, & Dankelman, 2009)
C1.5	Is the Aid visible in night lighting conditions by cover color, paper edge color, etc.? (Authority, 2006)
C1.6	Does the binding allow pages to be opened to a minimum of 180 degrees, with 360 degrees recommended? (Verdaasdonk, Stassen, Widhiasmara, & Dankelman, 2009)
C1.7	Is the cover space used effectively, e.g. with name of Aid? (Verdaasdonk, Stassen, Widhiasmara, & Dankelman, 2009)
C1.8	Is the cover durable and easy to distinguish? (Authority, 2006)
C1.9	Can the Aid be used with one hand? (Authority, 2006)
C1.10	Are there tabs and dividers to assist with locating pages? (Verdaasdonk, Stassen, Widhiasmara, & Dankelman, 2009)
C1.11	Is there spiral or ring side binding? (Verdaasdonk, Stassen, Widhiasmara, & Dankelman, 2009)
C1.12	Does the binding allow all the text to be read? (Verdaasdonk, Stassen, Widhiasmara, & Dankelman, 2009)
C1.13	Is the Aid stored in readily accessible locations, both physical and electronic (Verdaasdonk, Stassen, Widhiasmara, & Dankelman, 2009)
C1.14	Are there clear differences between each type of checklist within the Aid? (Verdaasdonk, Stassen, Widhiasmara, & Dankelman, 2009)
C1.15	Was anti-glare plastic used to laminate documents (if applicable). (Degani, 1992)
C1.16	Ensure that the quality of the print and the paper is well above normal standards. Poor quality of the print will affect legibility and readability. (Degani, 1992)
C1.17	Are the tabs clearly identified? (Authority, 2006)
C1.18	Are the tabs wide enough to place a thumb on? (Authority, 2006)
C1.19	Are tabs and dividers consistent in color? (Authority, 2006)
C2	<b>Typography, Symbology, Color, Graphics &amp; Display Characteristics: Font, font size, boldface, intuitive symbology, flashing test, font &amp; paper/display colors, etc.</b>
C2.1	Is the Aid title a mix of uppercase and lowercase letters, with the first letter increased in size for legibility? (B. K. Burian, 2006b)
C2.2	Are the titles clearly distinguished from the items underneath them? (B. K. Burian, 2006b)
C2.3	Is there an adequate use of white space with the printed text to ensure readability? (B. K. Burian,

#	Criteria
	2006b)
C2.4	Are repetitive visual motifs used throughout to facilitate tracking and searching? (Yannacci, Roberts, & Ganju, 2006)
C2.5	Is there a logo for the Aid for immediate visual recognition in an emergency? (Jones, 2005)
C2.6	Are graphics used appropriately (i.e., facilitate the understanding of information? (Jones, 2005)
C2.7	When used, are pictures on the left and text on the right? (Yannacci et al., 2006)
C2.8	Are photographs rather than clip art used when applicable? (Yannacci et al., 2006)
C2.9	If used at all, are italics only employed for short notes and supporting information? (Authority, 2006)
C2.10	Are headings in upper case? (Authority, 2006)
C2.11	Does the Aid use the following techniques sparingly and only for emphasis (Bold type, Larger type, Underlining, Boxing text on a white or coloured background)? (Authority, 2006)
C2.12	Are explanatory notes formatted distinctly through italics, color or font size? (Authority, 2006)
C2.13	Are decision items made clear using one or more of the following strategies: Different style of bullets, a choice directive (i.e., choose one), highlighting choices using underline, margin lines, and/or indenting to group choices together? (Authority, 2006)
C2.14	Are critical items highlighted or identified in a consistent and unambiguous way? (Authority, 2006)
C2.15	Is color used to illustrate things referenced in the Aid that are designed based on color (e.g., signage, vests, etc.) (Authority, 2006)
C2.16	Is pastel shading used sparingly to discriminate specific items in the guide? (Authority, 2006)
C2.17	Is 14 point for headings and 12 point for text used throughout? (Verdaasdonk et al., 2009)
C2.18	Can the thumb be used to guide the eye down the page without obscuring the text? (Authority, 2006)
C2.19	Is text legible at arms length? (Authority, 2006)
C2.20	Are there dashes or bullets in front of separate tasks for clarity? (Verdaasdonk et al., 2009)
C2.21	Does the Aid use sans-serif fonts? (Gill Medium has been found to be most legible for some purposes). (Degani, 1992)
C2.22	Are long chunks of text set in lower case (i.e. not all upper case)? (Degani, 1992)
C2.23	If upper case is required, is the first letter of the word larger in order to enhance the legibility of the word. (Degani, 1992)
C2.24	As a general recommendation, the “x” height of a font used for important flight-deck documentation should not be below 0.10 inch. .11 inches more legible (about 11 pt Helvetica). .14 - .20 ideal. (Degani, 1992)
C2.25	Is the height-to-width ratio of the primary font 5:3? (Degani, 1992)
C2.26	Is the vertical spacing between lines at least 25-33% of the overall size of the font. (Degani, 1992)
C2.27	Is the horizontal spacing between characters 25% of the overall size and not less than one stroke width? (Degani, 1992)
C2.28	Are fewer than three typefaces used? (Degani, 1992)
C2.29	Is most of the Aid black characters over a white background? (Degani, 1992)
C2.30	Does the Aid avoid using white characters over a black background for normal text? (Degani, 1992)
C2.31	Does the Aid avoid using black over dark red, green, and blue? (Degani, 1992)
C3	Layout, Format, & Display: Visual look, arrangement, philosophy of response/use

#	Criteria
C3.1	Does the Aid describe <b>how</b> it should be used, e.g., consulted during meetings, read before a specific call, or with prompting by a staff member? (Verdaasdonk et al., 2009)
C3.2	Are there titles and roles for users of the Aid listed? (B. K. Burian, 2006b)
C3.3	Is it noted when someone else needs to be consulted? (B. K. Burian, 2006b)
C3.4	Are choices formatted differently than standard actions to make it clear that a choice is involved? (B. K. Burian, 2006b)
C3.5	Is the end of each procedure clearly indicated? (B. K. Burian, 2006b)
C3.6	Are actions that require verification from someone else formatted distinctly? (Authority, 2006)
C3.7	Are explanatory notes succinct and linked directly to the action item they are connected to? (Authority, 2006)
C3.8	Do sections clearly show when they continue onto another page? (Authority, 2006)
C3.9	Are figures and tables clearly linked to an item (Authority, 2006)
C3.10	Are there clear page and tab references on each page? (Authority, 2006)
C3.11	Are page numbers in a large font at the top or bottom of the page? (Authority, 2006)
C3.12	Are cautionary notes included and made distinct through color or formatting ? (Authority, 2006)
C3.13	If a full Toolkit, is a set of notes outlining the Decision Aid presentation philosophy included? (Authority, 2006)
C3.14	If applicable, do these notes provide explicit detail on how to interpret items within the Decision Aid? (Authority, 2006)
C3.15	Is there a prominent title at the start of each section? (Authority, 2006)
C3.16	Does the section title or other information co-located with the title reflect when the section should be used/is applicable? (Authority, 2006)
C3.17	Is the title clearly distinguishable from the action items? (Authority, 2006)
C3.18	Is the format consistent between all Aidslike sections? (Verdaasdonk et al., 2009)
C3.19	Are tables or bullet lists structured in clear rows and columns to aid decision-making? (Wyatt, 2000)
C4	<b>Organization, Access to &amp; Prioritization of Content</b>
C4.1	Are there multiple ways to find a particular section within a Decision Aid? (Index, Table of Contents, etc) (B. K. Burian, 2006b)
C4.2	Are Decision Aid names the same as alerts we would receive? (B. K. Burian, 2006b)
C4.3	Is distribution equal to the number of places the Aid will be used? (Verdaasdonk, Stassen, Widhiasmara, & Dankelman, 2009)
C4.4	Do essential or critical steps or information appear early in the Aid? (B. K. Burian, 2006b)
C4.5	Does the front of each tab page describe the contents of that tab? (Authority, 2006)
C4.6	Is each item in the Aid/section table of contents linked to a tab by a line or by color. (Authority, 2006)
C4.7	Are pages numbered both overall and within each tab? (Authority, 2006)
C4.8	Are the tabs logically linked to the index? (Authority, 2006)
C4.9	Do tasks or sections appear in the same order as their titles do in the Table of Contents? (Verdaasdonk et al., 2009)
C4.10	Is a content list provided in the front? (Verdaasdonk et al., 2009)
C4.11	Is an alphabetical index at the end? (Verdaasdonk et al., 2009)
C4.12	Is the most important information placed first or last? (Wyatt, 2000)

#	Criteria
C4.13	Is context given to let you know when you approach the end of the Aid's usefulness? (Pritchett, Nix, & Ockerman, 2001)
C5	<b>Purpose: Fix, troubleshoot, stabilize/safe, disable/isolate, direct action, inform, assess, support decision making</b>
C5.1	Is overall purpose of Decision Aid noted? (B. K. Burian, 2006b)
C5.2	Is there a status review included after all items? (Authority, 2006)
C5.3	Is the purpose noted for key Aid steps or groups of steps? (B. K. Burian, 2006b)
C5.4	Is the purpose emphasized for critical actions? (Yannacci et al., 2006)
C6	<b>Length &amp; Workload: Physical length, timing length, workload, who completes step</b>
C6.1	Is responsibility noted for each key task or decision? (Authority, 2006)
C6.2	Are long procedures or decisions broken into smaller chunks? (Verdaasdonk et al., 2009)
C6.3	Does the Aid assist the user in timing actions relative to the actions of others (when that is necessary)? (B. K. Burian, 2011)
C6.4	Can the steps within procedures be adequately carried out in the amount of time likely to be available? (B. K. Burian, 2011)
C6.5	Is there a simple mnemonic to remember critical items? (Verdaasdonk et al., 2009)
C6.6	Are cues included to remind users of hard to recall information or information that must be attended to? (B. K. Burian, 2006b)
C7	<b>Nomenclature, Abbreviations &amp; Numerical Information: Terms, labels, abbreviations, numerical information</b>
C7.1	Are the entire titles of sections used, rather than abbreviations? (B. K. Burian, 2006b)
C7.2	Are terms, labels, and abbreviations consistent within an Aid and across other documents to be used for the same situation? (Verdaasdonk et al., 2009)
C8	<b>Language, Grammar, &amp; Wording: English?, verb tense, reading difficulty, clarity, orientation/perspective, level of directiveness</b>
C8.1	Are social and cultural influences on response performance by Aid users addressed? (B. K. Burian, 2006b)
C8.2	Are the tone and content consistent with each other? (Yannacci et al., 2006)
C8.3	Is powerful (strong, active, purposeful) rather than powerless (hesitations, qualifiers, passive) language used throughout? (Yannacci et al., 2006)
C8.4	Are decisions and actions framed positively (e.g., benefits discussed, confidence expressed) when execution speed is key? (Falzer, 2004)
C8.5	Are decisions and actions framed negatively (e.g., potential losses mentioned), when deliberation is needed? (Falzer, 2004)
C8.6	Are the required responses unequivocal and clearly defined? (Authority, 2006)
C8.7	Is the style conversational, with short words and sentences (if used)? (Wyatt, 2000)
C9	<b>Level of Detail: Amount of information provided particularly with regard to how to perform an action or why</b>

#	Criteria
C9.1	Are items included to help leaders interpret information to better define a situation? (B. K. Burian, 2006b)
C9.2	Are laws or regulations that need to be conformed to cited? (B. K. Burian, 2006b)
C9.3	Are operational (e.g., overall) requirements stipulated to make the big picture more clear? (B. K. Burian, 2006b)
C9.4	Is the same information given consistently throughout for similar activities? (B. K. Burian, 2006b)
C9.5	Are memory items included and noted as items to be memorized and performed from memory? (Authority, 2006)
C9.6	Are memory items kept to fewer than four, certainly no more than six? (Authority, 2006)
C9.7	Is there information on the amount of time users have to complete the items? (B. K. Burian, 2006b)
C9.8	Does the Aid use as few words as possible while remaining unambiguous and including all essential information? (Verdaasdonk et al., 2009)
C9.9	Does the Aid/section describe the scenario that should lead to its use? (Authority, 2006)
C9.10	Does the Aid/section repeat any specific warnings that lead to its use? (Authority, 2006)
C9.11	Does the Aid/section contain an Objective? (Authority, 2006)
<b>C10</b>	<b>Comprehensive &amp; Correct: All necessary steps are included, actions are appropriate for the situation</b>
C10.1	Contains only critical items (as measured by these criteria and criteria A(Quarantelli) and B (Yukl)) (B. K. Burian, 2006b)
C10.2	Are there alternate actions to be used if time is short? (B. K. Burian, 2006b)
C10.3	Is information included on what to do if the prescribed tasks fail? (B. K. Burian, 2006b)
C10.4	Is there information given that lessens the amount of mental calculation required? (B. K. Burian, 2006b)
C10.5	Are general items or background information needed to be remembered included somewhere in the Aid to reduce memory burden? (B. K. Burian, 2006b)
C10.6	Are actions that should be avoided included in the Decision Aid? (i.e., Do NOT do this) (B. K. Burian, 2006b)
C10.7	Are factors specific to the emergency included accurately in the Aid? (B. K. Burian, 2006b)
C10.8	Does the Aid explicitly call attention to issues the Leader should address when evaluating situations. (B. K. Burian, 2006b)
C10.9	Is there an amendment page noting date and amendment status for changes? (Authority, 2006)
C10.10	Are changes highlighted in the margins where the changes occurred? (Authority, 2006)
<b>C11</b>	<b>Logical Coherence: Order of steps/timing makes “sense” to the ICS system, Aid users, and for the scenario</b>
C11.1	Is the sequence of steps appropriate to the response structure?
C11.2	Are the actions noted in the Aid appropriate to the scenario and/or function?
C11.3	Are the triggers for specific actions appropriate to the scenario?
C11.4	Are steps sequentially numbered and connected? (Authority, 2006)
C11.5	Are items noted by the phase or scenario in which they would be used (and not where they wouldn't be)? (B. K. Burian, 2006b)
C11.6	When possible, are concurrent procedures shown together by responsible party in one timeline,

#	Criteria
C11.7	coupled with a rationale for each step? (Pritchett et al., 2001) Are deferred items to be completed in later phases noted at end of procedures (when applicable)? (Authority, 2006)
C12	<b>Progression &amp; Jumping (aka Procedure Navigation): Movement within and between procedures/manuals and other materials</b>
C12.1	Is there one Decision Aid for a situation so that users can “get in and stay in” the aid with a minimum of jumping between aids? (B. K. Burian, 2006b)
C12.2	Are exact locations given for all referenced documents, on paper or electronic, to facilitate locating those documents? (B. K. Burian, 2006b)
C12.3	Are steps repeated where needed to prevent cross-referencing? (Authority, 2006)
C12.4	When cross-referencing is used, are steps numbered for specificity? (Authority, 2006)
C12.5	Are links to other aids clearly stated, including to the relevant page number? (Authority, 2006)

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