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1.0 POLICY/PURPOSE

Santa Barbara Applied Research (SBAR) prepares graphics for its products and services that meet or exceed the quality objectives of our customers. The purpose of this work instruction (WI) is to ensure that graphics produced by SBAR are of consistent quality, and are incorporated into the products and services we provide in a method that best supports our customer's needs in a timely and efficient manner.

2.0 SCOPE

This operating procedure applies to the MCA Engineers Division of SBAR located in Ventura, CA (VTA).

3.0 REFERENCES AND DEFINITIONS

3.1 References

ISO 9001: Quality Management Systems-Requirements, Third Edition (2000-12-15)

- ISO 9001 Element 7.3 Design and Development

SBAR Documents:

- SBAR *Quality Manual*
- SBAR *Process Control Procedure*

3.2 Definitions

Animation: The illusion of movement produced by displaying a series of successive images. For successful animation sequences, images must replace one another rapidly enough to appear to be continuous movement, i.e., at least 14 frames per second (fps).

Anti-Aliasing: Software adjustment to make diagonal or curved lines appear smooth and continuous in computer-generated images.


Audio: Sound-based sensory stimuli. In some cases, audio cues may be the sole sensory stimulus possible. In most cases, audio is used to reinforce other sensory stimuli.

Computer-Based Training (CBT): Instruction delivered with the aid of a computer.

Frames Per Second (fps): The rate at which successive frames of an animation are displayed to provide an illusion of motion.

Functional Area Manager (FAM): A senior supervisory individual who is responsible for the leadership, direction, and overall success of an area of the company, such as procurement, specific contracts, logistics, training, quality, safety, engineering, finance, etc.



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Instructional Designer (ID): A senior individual who is responsible for the leadership, direction, and overall success of the graphic design, development, and deployment team.

Interactive Courseware (ICW): Computer controlled courseware that relies on trainee input to determine the pace, sequence, and content of training delivery using more than one type of medium to convey the content of instruction. ICW can link a combination of media, to include but not be limited to; programmed instruction, video tapes, slides, film, television, text, graphics, digital audio, animation, and up to full motion video, to enhance the learning process.

Interactive Multimedia Instruction (IMI): A term that is applied to a group of predominantly interactive, electronically delivered training and training support products. IMI products include instructional software and software management tools used in support of instructional programs.

Launch Acceptability Region (LAR): The calculated region at some distance from a target that a pilot must reach to launch a guided munitions for that weapon to have an acceptable probability of hitting that target.

Plan of Action and Milestones (POA&M): An action plan used to determine goals for the logistic implementation of a task or delivery.

Procedure: A corporate-level, written direction that defines the specific strategy that SBAR employs in performing a task (e.g., quality, human resources, training, financial). Procedures give general guidance, and where applicable, apply throughout all levels of the corporation.

Process: Set of interrelated resources and activities that transform inputs into outputs. Specifically, processes are the manner in which SBAR combines resources (e.g., personnel, equipment, and materials) in order to deliver its products and services. Processes include, but are not limited to, program management, contracts management, financial management, quality program, operations and maintenance, corrosion control, logistics, etc.


Quality Assurance (QA): Method of assuring uniform quality throughout a process.

Records: Documents/data that furnish objective evidence of activities performed or results achieved. Records provide objective evidence of the fulfillment of specified requirements. Records include, but are not limited to, procedures, inspection reports, training records, drawings, etc.

Super Video Graphics Adapter (SVGA): A device used to display high color graphics on a computer monitor.

Subject Matter Expert (SME): An individual who has a thorough knowledge of a job, duties/tasks, or a particular topic.




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Training: Instruction and/or applied exercises for the attainment and retention of knowledge, skills, and attitudes.

Virtual Reality (VR): A computer-generated environment that simulates a third dimension on a computer output device through a series of highly complex graphic calculations.

Work Instruction (WI): Written details that, when appropriate, state what shall be done and by whom; when, where, and how it shall be done; what materials, equipment, and documents shall be used; and how it shall be controlled and recorded. WIs are normally used to implement corporate procedures and/or specific contractual requirements.



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4.0 RESPONSIBILITIES

4.1 Instructional Designer/Functional Area Manager

The ID is responsible for the leadership, direction, and overall success of the graphic design, development, and deployment team. The ID:

- Develops instructional strategy for the graphic content and design requirements
- Oversees the graphics and media development team
- Oversees and directs the overall development process.

The ID serves as the FAM for graphics products and therefore responsible for ensuring that graphics products are produced in conformance with contract specifications prior to delivery to the customer.

4.2 Graphics Developers

Unless otherwise directed by the FAM due to specific requirements imposed by contract, each SBAR employee involved in graphics production conforms to the specifications of this WI. Training in the provisions of this WI is provided to each SBAR employee involved in graphics production.

5.0 REQUIREMENTS/PROCEDURES

5.1 General

Graphics are utilized in almost everything produced at VTA. From web sites to IMI and product packaging, graphics are the visual component of our products and for that reason they must meet or exceed the high standard of quality that our customers expect. To achieve this standard of quality, SBAR utilizes a set of quality processes and standards for use by the graphics department.

5.2 Graphic Design Process

This section explains the processes and methods that SBAR uses to define and develop graphics. Table 5-1 summarizes the SBAR graphic development process. Figure 5-1 is a flow chart that details the SBAR graphic development process. The ID reviews graphics design, development, use, and implementation and, as necessary, the SME verifies the accuracy of technical content. Attachment 1 is a checklist of the graphics design process. This checklist is completed by the ID/FAM upon completion of the deliverable to ensure that quality graphics are provided to SBAR customers. The checklist is maintained in the Project Folder.

5.3 Screen Layout, Color Usage, and Text Standards

This section addresses the screen usage for the following:

- Graphics background and text,

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- Callout pointers and directional arrows, and
- Navigational icons.

5.3.1 Graphics Background and Text Standards

The usage standards for the graphics background and text color are addressed below.

- Use Adobe PhotoShop in Red Green Blue (RGB) mode.
- Graphics backgrounds and text color comply with display specifications for standard screen graphics developed for the project and are derived from a common color palette.
- When multiple backgrounds are used, they comply with the color palette referenced above, and maintain the appearance of similarity for continuity throughout the project.

Table 5-1. SBAR Graphic Development Summary

Phase	Components
1. Analyze	a. Review requirements with customer/SME. b. Define software needs. c. Assess current workload for prioritization.
2. Plan	a. Determine scope of work. b. Determine general “look and feel.” c. Establish POA&M.
3. Design	a. Determine level of technical content. b. Create rough drafts.
4. Develop	a. Produce media elements. b. Incorporate into product.
5. Evaluate	a. Perform media Quality Assurance (QA) <ul style="list-style-type: none">- Confirm integrity.- Technical accuracy.
6. Deploy	a. Deliver product.
7. Evaluate	a. Receive customer feedback.

- Use graphics formats (i.e., TIFFS, JPEGs, GIFFs) in accordance with the customer’s needs as detailed in the Statement of Work.
- Avoid ornamentation or any nonstandard artistic effect added to the background that does not contribute to instructional value or readability of the text or graphics used.

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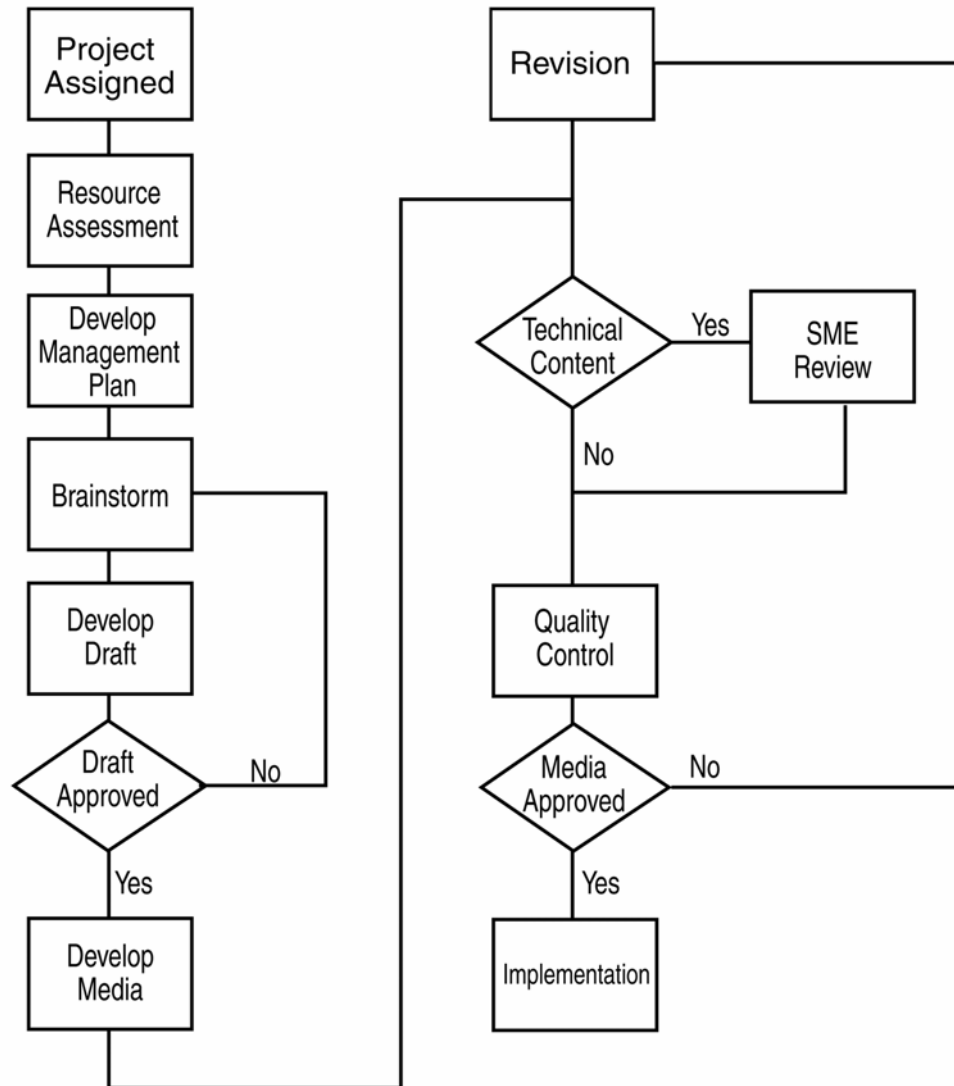


Figure 5-1. Graphic Development Process

5.3.2 Callout and Arrow Color Standards

The ICW usage standards for callout pointers and directional arrow colors are addressed below.

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- Derive color for the callout pointers and directional arrows from a common color palette.
- Choose color for the callout pointers and directional arrows for its compatibility with the background color and content material while providing good contrast to, and a clear distinction from, content.
- When it is necessary to use callout pointers or directional arrows, their use should be clear and concise and kept to the minimum necessary to provide clarity of the material.
- Avoid ornamentation or any nonstandard artistic effect added to the pointer or arrows that does not contribute to their instructional value.

5.3.3 Navigational Icon Color Standard

The standard navigational buttons are presented in ICW Design Standards. The ICW usage standards for navigational icon colors are addressed below.

- Derive color for the navigational icons from a common color palette.
- Choose color for the navigational icons for its compatibility with the background color and content material while providing continuity to, and a clear distinction from, content.

5.3.4 Specific Text Standards

Use the authoring platform's text tool to implement the text standards listed below.

- Derive color for the text from a common color palette.
- Choose color for the text for its compatibility with the background color and content material while providing continuity to, and a clear distinction from, background.
- Wherever possible, specific colors should be used to differentiate informational text from directional text.
- Text should not produce a tangency with, or run-over, borders of bounding boxes or buttons intended to encapsulate it. Likewise, sufficient space should be provided to separate all text and graphic elements.
- Typefaces are comprised of a set of fonts that are of the San-Serif variety with an equal stroke weight and included with the operating system package of fonts for the target platform.

5.4 Graphics Usage

The following graphic usage standards are for two-dimensional and three-dimensional graphics.



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- Graphic creation and implementation complies with guidelines outlined in the Statement of Work for a given project. Avoid ornamentation or any nonstandard artistic effects that do not contribute to the instructional value of the graphic.
- Graphics for ICW development comply with all standards addressed in Section 5.3 regarding screen layout for graphics.
- Use the San Serif font, Arial, in a color that contrasts with the background graphic to label any specific graphical components or processes.
- Use standard hardware (e.g., aircraft, panels, and displays) colors and corresponding dimensions to display graphical components. Do not change colors in graphics that are displayed repeatedly.
- Use consistent spacing between two graphics that are displayed side by side.

5.5 Animation and Video Usage

The ICW usage standards for two-dimensional and three-dimensional graphical animation are addressed below.

- Use cinapac compression.
- The video output specification is 16 Bit SVGA, high color specification with thousands of colors.
- Frame rate is 30 fps.
- Animation complies with display specifications for standard screens with animation boxes.
- Design two-dimensional animation to depict graphical movement and process flow (e.g., aircraft fuel system flow, LAR dynamic movement).
- Design three-dimensional animation to depict single graphical object dynamics (e.g., weapon components, weapon flight path) and multiple graphical object dynamics (e.g., multiple aircraft demonstrating maneuvering tactics).
- Avoid animation and special effects that do not contribute to the instructional value of the project.
- Use the San Serif font, Arial, in a color that contrasts with the background graphics to label any specific animation components or processes.
- Keep animation lines, colors, and object distinctions as clear and uncluttered as possible and use contrasting colors to display distinctions between animation components.

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- Panels and displays are drawn in the exact location for a standard screen type. This consistent location is critical for animated graphics to ensure that the panel or display does not appear to move or shift location while transitioning to the next screen.
- Use the REPEAT icon to allow users to review the entire animation sequence again.
- Animation consists of a reasonable number of frames for the entire clip. This procedure ensures that individual clips are not taking large amounts of hard disk space, which tends to cause skipped frames on an animation clip when being played.
- When designing an animation clip, be conscious of the high cost of the respective task, file size, and memory utilization.

5.6 Video Creation

The following are the video usage standards for the graphics department.

- Use cinapac compression.
- The video output specification is 16 Bit SVGA, high color specification with thousands of colors.
- Frame rate is 30 fps.
- Videos are no longer than absolutely necessary to convey the instructional point and cropped to avoid the inclusion of unnecessary and distracting background.
- Commercial high-quality (CD presentation) video for instructional multimedia projects is very expensive to develop. Therefore, limit the creation of video to instructional purposes, mastery of specific knowledge, and/or skill learning objectives.
- When designing video into a lesson, be conscious of the high cost of ICW video, file size, memory utilization, and compression reduction requirements.
- When designing ICW video, specify audio synchronization requirements on the storyboard.
- Use the San Serif font, Arial, in a color that contrasts with the background video to label any specific video components or processes.
- Use the Video Controls addressed in the [*Interactive Multimedia Instruction, Storyboard Design and Development WI \(CP-00-13004-02\)*](#) on navigational icons to allow users to manipulate the ICW instructional video clips using the standard video control options.



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5.7 Audio Creation

The audio usage standards are as follows.


- The audio specifications set forth in the Statement of Work for a given project may override specifics of this work instruction.
- When designing audio into a lesson, be conscious of the high cost of audio, file size, memory utilization, and compression reduction requirements.
- Audio is short and concise.
- When designing audio, specify video synchronization requirements on the storyboard.
- When required, use the corresponding audio controls addressed in the [Interactive Multimedia Instruction, Storyboard Design and Development WI \(CP-00-13004-02\)](#) to allow users to manipulate the ICW instructional audio clips using the standard audio control options.
- Design audio that contributes sound instructional values, (e.g., aircraft alarms and missile tones) and is critical for mastery of a specific learning objective.
- Do not use voiceovers that replicate the exact text on the screen. Use voiceovers only when:
 - ✓ Text is nonexistent.
 - ✓ Directing attention to an animation/video sequence or demonstrated procedure.
 - ✓ Text bullets summarize the key training topics addressed in the instructional voice.

5.8 Virtual Reality Standards

The graphic development standards for VR environment user interface are addressed below.

- VR worlds are saved in XVR format, which is a compressed format used for publishing worlds on standalone applications or ActiveX controls or for using Superscape 3D control.
- XVR files are saved in “Auto Detect” mode (unless otherwise specified by contract). This mode checks the hardware and selects the best display option for running the XVR file.
- VR either runs full screen, or complies with display specifications for standard screens with VR boxes.



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- Design the VR environment to depict actual environment scenarios or to give the user control over parts or components not available with standard two-dimensional or three-dimensional graphical means.
- Design the VR environment so that it incorporates sound instructional value and contributes to the mastery of specific learning objectives.
- Keep VR environments and object distinctions as clear as possible between components in order to avoid user disorientation
- Avoid modeling objects or incorporating effects that do not contribute to the instructional value of the ICW.
- Use the REPEAT icon to allow the user to review the entire VR scenario again.

5.9 Number Usage

The graphic standards for number usage are as follows.

- Use numbers exactly as they appear in aircraft panels, displays, gauges, or cockpit indicators.



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Attachment 1. Graphics Design Checklist

Graphics Design, Development, and
Implementation ChecklistDESCRIPTION OF WORK TO BE PERFORMED

Project Name:
Charge #:
Date:

Graphics Design Process	Yes	No*	N/A*
1) Graphics requirements reviewed with customer/SME prior to initiating work.			
2) Scope of work determined and POA&M established prior to initiating work.			
3) Rough drafts created and reviewed with SME and/or customer, as required.			
4) Media elements produced and incorporated into product.			
5) Quality evaluated for conformance to requirements and technical accuracy.			
6) Repeat steps 3, 4, and 5 as appropriate.			
7) Final product delivered.			
8) Upon customer acceptance of product, original and copy of media (electronic and paper, if applicable) retained in contract file.			
9) All "rough" versions of media (both electronic and paper) destroyed except for original and deliverable.			
10) Graphics Design Checklist completed and placed in contract file.			


*Explain "No" and "N/A" entries: _____

Signed: _____ Date: _____



Quality Assurance Work Instruction

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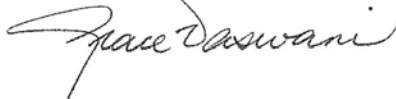
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