

Component Explosive Damage Assessment Worksheet (CEDAW)

BACKGROUND

The Component Explosive Damage Assessment Worksheet (CEDAW) is an Excel© based tool for the assessment of structural components subjected to airblast loads from explosives using pressure-impulse (P-i) methodology.

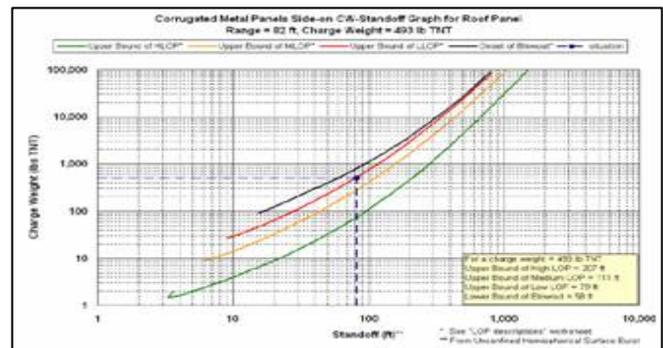
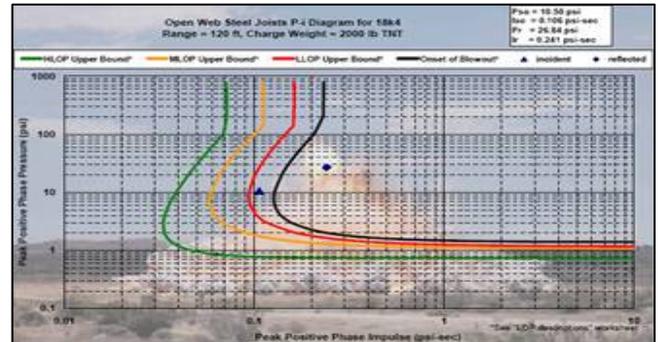
CEDAW will calculate the P-i and associated charge weight-standoff (CW-S) relationships for 11 common structural elements. The user enters basic structural geometry, component boundary conditions, material properties, response mode, and threat (charge weight and standoff distance). CEDAW then generates the P-i and CW-S diagrams with threat parameters shown for graphical interpretation of the expected level of protection. CW-S plots for both fully reflected and side-on pressures are provided. Standard materials and members can be selected from dropdown menus, and various support conditions can be selected for one-way and two-way members.

CEDAW produces the P-i diagrams for a specific component by unscaling dimensionless P-i relationships for each component. The CW-S charts are produced by applying the Kingery-Bulmash relationships for HE explosives in a hemispherical surface burst configuration. Because there is no iterative process involved, results are produced almost instantaneously.

While intended for the assessment of existing structures, the CW-S charts produced by CEDAW are also suitable for preliminary siting studies for proposed structures.

INTENDED USER

CEDAW was developed for structural engineers with solid knowledge of structural dynamics and blast effects. This tool is not for the non-structural engineer. CEDAW will aid the engineer in assessment of the member, but the actual assessment of members, connections, and supporting structure is the full responsibility of the engineer.



DISTRIBUTION

Distribution Statement A: Approved for public release; distribution is unlimited.

POINT OF CONTACT

U.S. Army Corps of Engineers
Protective Design Center

Internet:

Web Page: <https://pdc.usace.army.mil/software/cedaw>

Help Page: <https://pdc.usace.army.mil/software/cedaw/help>

email: PDC.Web@usace.army.mil

SIPRNet:

email: pdcmail@usace-pdc.army.smil.mil



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Single-Degree-of-Freedom Blast Effects Design Spreadsheet (SBEDS)

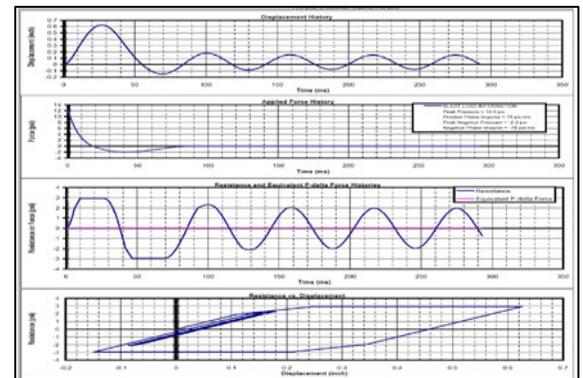
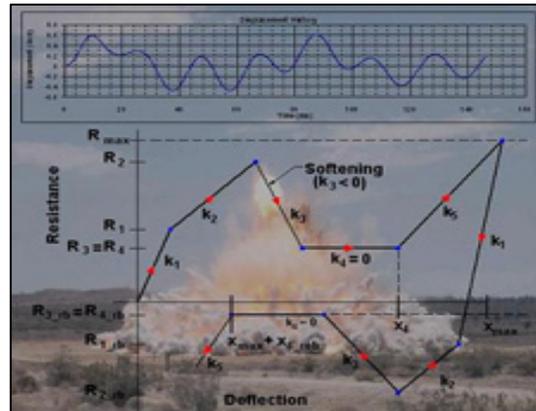
BACKGROUND

The Single-Degree-of-Freedom Blast Effects Design Spreadsheet (SBEDS) is an Excel[®] based tool for the design and analysis of structural components subjected to dynamic loads, such as airblast from explosives, using single-degree-of-freedom (SDOF) methodology. SBEDS is based on UFC 3-340-01 and UFC 3-340-02, but draws on other sources where improved methodologies are available.

The user can select from a library of common component types, then enter parameters related to the component geometry, support conditions, material properties and loading. Based on these inputs SBEDS will calculate the SDOF properties and dynamic response of the component. SBEDS can also generate Pressure-impulse (P-i) curves of the component for use in assessments or preliminary designs.

The component library includes masonry, concrete, steel, aluminum, cold-formed, and wood members. The user can select standard component shapes and materials using drop-down menus, or can manually input the component section and material properties. Dropdown menus are used to specify support conditions, load distribution, and modes of response (i.e. flexural, compression membrane and tension membrane). In addition to common structural components, SBEDS can also evaluate the dynamic response of a general SDOF system.

Static and dynamic axial loads, either uniformly distributed or concentrated, are accommodated for many components. Loads can be input by the user directly or using pressure-time history files, or can be calculated by SBEDS based on a user-specified explosive and standoff.



DISTRIBUTION

Distribution Statement A: Approved for public release; distribution is unlimited.

POINT OF CONTACT

U.S. Army Corps of Engineers
Protective Design Center

Internet:

Web Page: <https://pdc.usace.army.mil/software/sbeds>

email: PDC.Web@usace.army.mil

SIPRNet:

email: pdcmail@usace-pdc.army.smil.mil

INTENDED USER

SBEDS was developed for structural engineers with solid knowledge of structural engineering, dynamics, and blast effects. This tool is not for the non-engineer. SBEDS is suited for preliminary design or final design when used by a skilled engineer. SBEDS will aid the engineer in design of the member, but the actual design of members and connections is the full responsibility of the engineer.



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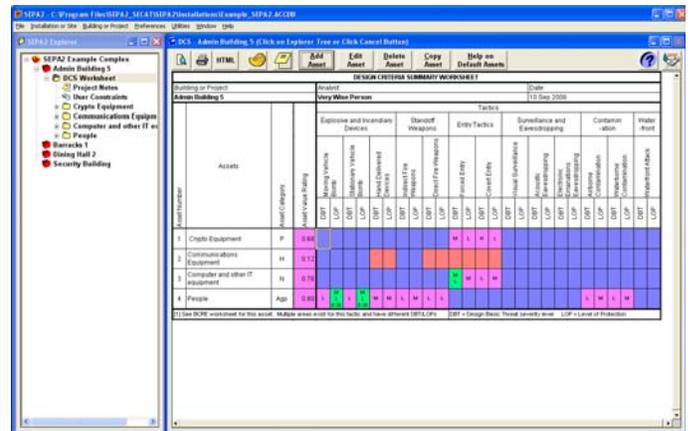
Security Engineering Planning Assistant (SEPA2)

BACKGROUND

Security Engineering Planning Assistant (SEPA2) is a Windows-based program created to assist users through the planning phase of a facility's protective system design. SEPA2 automates the Risk Analysis procedure defined in UFC 4-020-01 DoD Security Engineering Facility Planning Manual. The Risk Analysis procedure includes looking at the types of potential aggressors and their tactics. SEPA2 develops the threat level and the appropriate level of protection based on the users inputs.

SEPA2 is a wholly owned government program.

US Army has certified SEPA2 as net worthy



INTENDED USER

The users of SEPA include installation facility planning and Vulnerability Assessment teams.

DISTRIBUTION

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POINT OF CONTACT

U.S. Army Corps of Engineers
Protective Design Center

Internet:

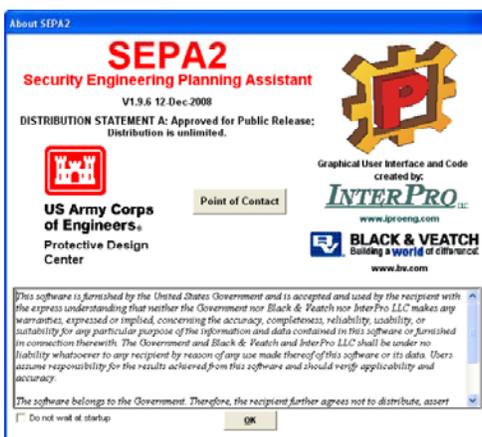
Web Page: <https://pdc.usace.army.mil/software/sepa>

Help Page: <https://pdc.usace.army.mil/software/sepa/help>

email: PDC.Web@usace.army.mil

SIIPNet:

email: pdcmail@usace-pdc.army.smil.mil



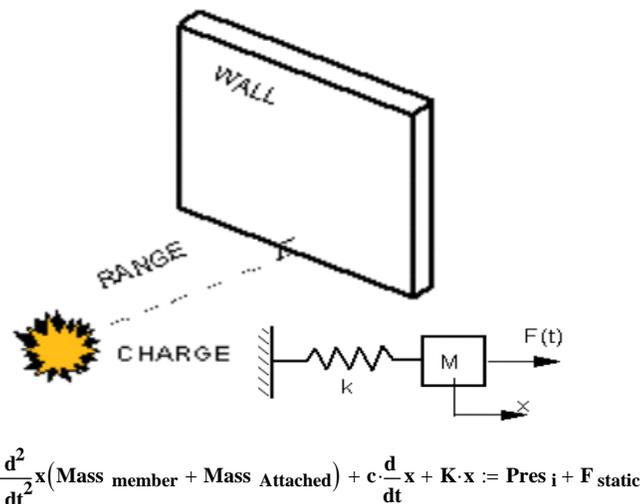
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Single-degree of freedom Plastic Analysis (SPAN)

BACKGROUND

SPAN is the product of many years of development. It was developed as an in-house Single-Degree-of-Freedom code to aid in the design and analysis of structural members subjected to dynamic loads. SPAN was written originally for design and analysis of hardened structural members subjected to high explosive loadings. These dynamic loads can be generated from any type of explosion that results in a uniform load on the face of the member. The uniform loading could be any of the following types; air blast, or ground shock. It performs an equivalent single degree of freedom dynamic analysis of the response of a structural member. It is a useful tool in analysis of conventional construction subjected to any uniform dynamic load. SPAN is currently version 1.3.0.0 and is limited distribution, critical technology.



CAPABILITIES

Current capabilities of the SPAN include:

- Analysis of one-way and two-way Steel members
- Analysis of one-way and two-way Reinforced Concrete members
- User Defined member
- Accounts for both positive and negative resistance
- Hysteresis effects accounted for
- Virtually any uniform dynamic loading
- Soil Media Interaction model for Ground Shock
- Dynamic Data Exchange with Dplot for plots
- MS Windows Graphical User Interface (GUI)
- Dynamic Link Library version (used in AutoDesigner)
- DOS version
- Structural Analysis
- Help File

FUTURE OF SPAN

SPAN has been replaced by SBEDS, SPAN is still a very useful program geared toward design and analysis of hardened design using Reinforced Concrete and Steel materials.

OUTPUT

Input/Output summary containing the program input and summary response output printed to ASCII file and also displayed on the SPAN screen. Input/Output full response data, containing the program input and full response data. The full response data in columnar format contains all the response data for the given project and may be several hundred pages in length, this is the same data that is available for graphical output. Graphical output is plotted with Dplot include blast load pressure, blast load impulse, resistance vs. displacement, resistance vs. time, displacement vs. time, velocity vs. time, and acceleration vs. time.

POINT OF CONTACT

U.S. Army Corps of Engineers
Protective Design Center

Internet Website:

Web Page: <https://pdc.usace.army.mil/software/span>
Help Page: <https://pdc.usace.army.mil/software/span/help>
Email: <mailto:PDC.Web@usace.army.mil>

SIPRNet Website:

Email: pdcmail@usace-pdc.army.smil.mil



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VAPO Information Update

Vulnerability Assessment and Protection Option



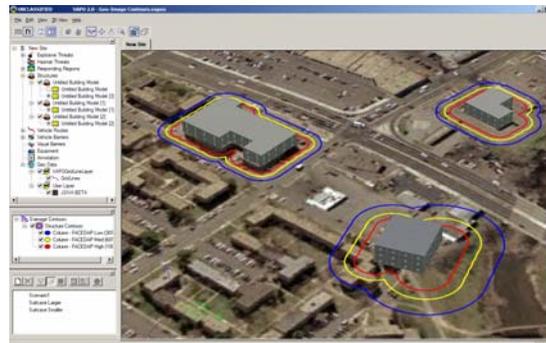
About VAPO

VAPO is a tool that will allow users to quickly model a facility, assess its vulnerability to terrorist threats, and compare mitigation/protection options. In addition, VAPO will display the results of the vulnerability assessment most effectively in three-dimensions for briefings to facility managers and property owners.

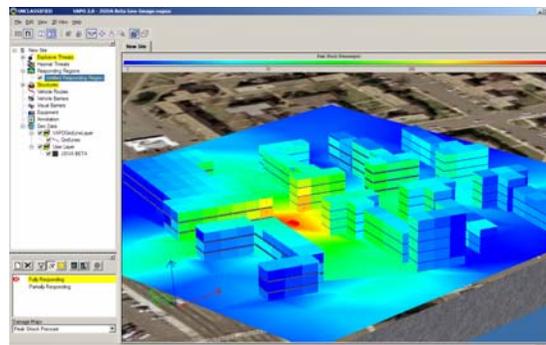
VAPO) .0

VAPO 5.0 is now available with the following features:

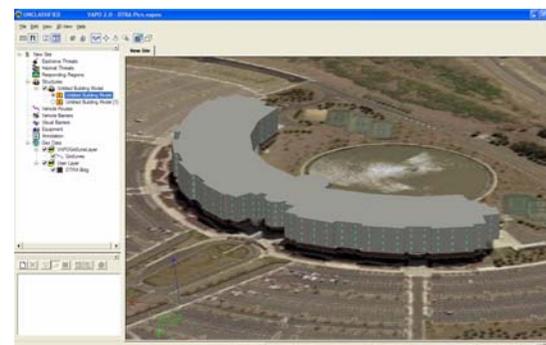
- Improved human injury and structural damage predictions through integration of the BICADS and CEDAW modules
- New threat types, including mortars (blast and fragments) and radiological releases
- Non-orthogonal building modeling for external blast environment predictions (similar to BEEM)
- Wood building types including frame and load-bearing wall structures
- Inclusion of BELT (Blast Estimation Look-up Tables) standoffs for updated contours
- Improved 2D and 3D display of blast environment and structural damage
- Partially Responding and Non-Responding buildings for faster, blast environment predictions
- Capability to enter detailed building occupancy information for use in human injury predictions and UFC building type identification for minimum standoff requirements



VAPO) .0 Feature: Color Contouring in 3D view



VAPO) .0 Feature: Building Pressure Overlay



VAPO) .0 Feature: Non-orthogonal Structures

User Assistance

Users can access Frequently Asked Questions (FAQs) or view the users forums and join in the discussions through the USACE PDC's (Protective Design Center) managed website at: <https://pdc.usace.army.mil/forums/software/vapo>. PDC internet VAPO pages can be found at <https://pdc.usace.army.mil/software/vapo> and SIPRnet pages at <http://usace-pdc.army.smil.mil/software/vapo>.

Additionally, VAPO is supported by DTRA's 24-7 Reachback Support Center. The Center may be contacted via phone, 703-767-3448, or e-mail, reachback@cntr.dtra.mil.

Requesting VAPO

VAPO distribution is currently being handled by DTRA's ACE (Assessment of Catastrophic Events) Center managed website: <https://acecenter.cntr.dtra.mil>.

Individuals wanting VAPO 5.0 will need an ACE Center account; click "[Request Account and Software](#)" from the login screen to complete these forms on the website. The VAPO Software User's Manual, training course slides, future training dates and patch updates can also be found at the site.

VAPO) .0 Training

VAPO 5.0 training will be handled by DTRA and the USACE PDC (Protective Design Center). DTRA will offer Level 1 training that will focus on how to access all the features that VAPO 5.0 has to offer. The PDC will offer an advanced VAPO Level 2 training that will provide students with an in-depth technical understanding of VAPO, how to use VAPO for vulnerability assessments and developing AT/FP plans. The Level 2 training will offer two enrollment classes a year as well as Mobile Training Teams (MTTs) that can be sent to a sponsor's location (expenses related to the MTT must be paid by the sponsor). PDC provided Level 2 training information can be found on the PDC managed website at: <https://pdc.usace.army.mil/training/vapo>.

Contact Information

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