Pitted Plate Assessment Tool
Background and Instructions
Prepared and developed by USCG/PVA working group using the guidance of the Ship's Structure Committee SSC-394 Strength Assessment of Pitted Plate Panels

From SSC-394 Jan. 8, 1997:

SSC-394 SR-1356 STRENGTH ASSESSMENT OF PITTED PLATE PANELS
In years past, the evaluation of adequacy of ship hull plates during drydocking has been highly based upon personal judgement of the evaluator. In general, the situation was usually obvious as to whether adequate strength remained in the plate or that the plate had to be replaced. Initial scantlings were much greater in older ships, leaving a larger margin for error. Borderline cases were generally treated conservatively by replacing the plate even if it was only deemed marginal. However, with the current climate in the marine industry, unnecessary repairs are not taken on as quickly. On the other hand a small crack causing what may once have just been regarded as a "nuisance leak" may well result in a significant oil spill today. In general, there is less margin for error in judgment than there was before.
This project provides a tool for the field inspector to evaluate a pitted plate on scene. By recording a few readily identifiable parameters and comparing them to graphs in the report a recommendation as to the acceptability of the plate section may be made. Should that not provide a clear enough criteria a program "PIT" may be used for further evaluation of the data. The report provides some detail as to the development of the program and parameters for it use.
The program "PIT" will be included in a later CD ROM version of this report.

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The original document can be found at the following link:
http://www.shipstructure.org/pdf/394.pdf

Background
The Passenger Vessel Association's (PVA) Director of Regulatory Affairs and Risk Management, Eric P. Christensen, was contacted by members of the PVA on various occasions regarding the approval of base metal repairs on small passenger vessels. These questions came from a variety of members from multiple USCG sectors throughout the country. After advocating for individual members, Mr. Christensen briefed the Safety and Security Committee on the issues and problems regarding repair proposals, including, in some instances, alternatives to "crop and renew" pitted plates. Mr. Christensen had disseminated the SSC394 report to members who were engaged in the appeals and reconsideration process.

This work product is a result of the teams effort to provide the “PIT” program in an easily assessable format

Directions for tool

Note: please see disclaimer for use,
acceptance is required to use this tool

Note: There is a conversion calculator (United States customary - metric) available in the program if needed.

STEP 1:
On page D-1 of appendix D, SSC 394 states:
"Locate a sample square 300 mm by 300 mm (12 in by 12 in) within the pitted panel that is visually judged to be representative of the full panel in terms of intensity, depth, and diameters of pits."
Different dimensions (a rectangle for instance) could be used for the sample plate as long as the sample is representative of the full panel.

Have the sample area to be assessed marked off with chalk.
Note that steps 2 and 4 below call for judgement to be used. There should be agreement among all inspecting personnel on input values to be used for these.

After determining the sample area:

Step 2. Count the number of pits in the sample area and enter this number as the Frequency input value.

Step 3. Enter the depth of the pit which is visually regarded as having the average depth for the sample square as the Average Depth input.
Step 4. Measure the deepest pit in the sample area and enter as the Maximum Depth input.
Step 5. Enter the diameter of the pit which is visually regarded as having the average diameter for the sample square as the Average Diameter input. This does not need to be the same pit used to determine the average depth
Step 6 Measure widest diameter in the sample area and enter this as the Maximum Diameter input. This does not need to be the same pit used to determine the maximum depth

For the next two steps (7&8), it should be noted that SSC394 recommends as sample plate as a 300X300 mm square. The tool will, however, allow different size sample areas (which should be subject to the considerations given at the beginning of these instructions). If a rectangular sample plate is needed, the checkbox below the the Plate Width (mm) input will need to be unchecked.

Step 7 Enter the width of the sample area as Plate Width (mm).
Step 8 Enter the height of the sample area as Plate Height (mm).
Step 9 Enter the plate thickness in the Plate Thickness (mm) field.

Default Value: A Cylinder Coefficient value of 0.67 is recommended by SSC394. This represents a semi-sphere shaped pit and is the default value for this input.
A smaller volume pit (shaped like a cone) would use a value of .33 whereas a more maximal volume would be given assuming a cylindrical shaped pit with a coefficient of 1.
Default Value: SSC394 recommends a Correlation Coefficient setting of 0.9. This represents a strong correlation between depth and diameter - the deeper pits tend to be wider. This is the default input.

Step 10 Hit the "Run Calculation" button to start the program

NEXT STEPS:
After running the program an email report can be generated. Select button and enter email and push send email

Use this data in your individual circumstances in preparing for a repair proposal. Further guidance can be downloaded here: (This will be a URL to material helpful to utilize this data)