



## **Historical Analysis Generator (HAG)**

### **Synopsis of Historical Analysis Generator (HAG)**

#### **OVERVIEW:**

##### **1. About the Historical Analysis Generator**

The Historical Analysis Generator (HAG) is a software tool for analyzing and reporting historical cost data of past construction projects. The tool was developed by Building Systems Design, Inc. for the Tri-Service Cost Engineer Committee.

The Historical Analysis Generator (HAG) is a part of TRACES and is used by the Army, Air Force, and Navy, to collect historical costs on awarded military construction projects. HAG provides the mechanism for projecting construction costs of facilities in the future.

The HAG database, primarily, contains historical cost data on Military Construction projects (although, the capability to add CW projects is built into the HAG system, via MATS). Each facility record includes the type of facility, its location, year of construction, award date, number of bidders, size and unit cost at award, the responsible Corps of Engineers District or other agency abbreviation, and other data which may be useful in analyzing a particular facility's cost as part of the larger group.

##### **2. Microsoft Windows User Interface**

The Historical Analysis Generator runs in conjunction with Microsoft Windows. The Generator's user interface is based on and consistent with the industry standards for Windows application programs.

##### **3. System Requirements**

The Historical Analysis Generator runs under the Microsoft Windows environment. The Generator requires Windows Version 3.1 or higher, with a suitable hardware configuration.

Installation of the software, system files, and the database requires a minimum of 7.2 megabytes of hard disk space.

##### **4. Summary of Functionality**

The main function of the Historical Analysis Generator is to select a set of cost data from a historical database and to produce comparative analyses of that data.

Working with queries is the overall process of selecting the data, sorting it, adjusting to normalize the costs, and viewing summary statistics.

Using the Historical Analysis Generator, you can:

- Create a query to view a limited subset of the database. You can query and view data at any of four levels: Projects, Facilities, Systems, or Subsystems. The result of a query is called a *data set*.
- Sort the data set in any of a variety of ways.

- Apply adjustment factors to normalize the costs of the data set.
- View summary statistics for the data set at the Facilities Level.
- Produce different types of summary reports of the data set. You can print the reports or copy them to a separate window for viewing.
- Add projects, facilities, systems, or subsystems to an historical database.
- Create new historical databases from scratch, or by copying and merging data from other databases.

## A. Available Reports

The Historical Analysis Generator produces a number of reports to support military cost engineering. Reports can be generated based on the current data set or on the entire Historical Database. You also have the option of sending reports to a separate window in the Microsoft Windows environment so the report data can be viewed on your screen. You can also send the results of multiple queries to separate windows for comparison before printing.

The following reports to support military cost engineering can be generated using HAG based on the current data set or an entire Historical Database, namely:

- DoD Facilities Report – This report provides historical analysis information organized first by Army Category Code, then by Size Standard within category code where appropriate and finally by Installation within each size group. The data includes the facility name, size, actual unit cost, cost factors, and normalized (Empirical) unit cost. Summary statistics are printed for each Size Standard and for each category code.
  - **Note:** The location factor used for cost adjustment is automatically set by the system to 1.00. The number of bids factor is automatically set to 0.0 (7 bids) to provide normal adjustment to the location base of 1.00. The Size adjustment is not applicable since facilities of similar size are grouped by size standard. To obtain similar information with custom location adjustment, use the Facilities Query Report.
  - **Note:** Facilities are listed by Army Category Codes. Any facilities in the query or database that do not have an Army Category Code are listed in a single group identified as having no code.
- Facilities Query Report – This report lists historical analysis information by facility similar to the DoD Report but without grouping. The current order of the query or database determines the order of the report. A single statistical summary is published at the end of the report. The data includes the facility name, size, base actual unit cost, cost factors, and normalized (Empirical) unit cost. You determine the target of the normalized cost adjustment with you current entries in the Normalized Cost Base window. The sample report in Appendix A.3 illustrates maintenance facilities adjusted to Fort Sam Houston at June 1995, a size of 60,000 SF, and a bidding climate characterized by an average of 4 bidders. The date target can be overridden in the Print Report dialog. The report is sorted by size.
- OSD Facilities Report – This report lists historical analysis information by facility. The data includes the facility name, size, base actual unit cost, cost factors, and normalized (Empirical) unit cost. Summary statistics are also printed. This report has both a Detail and Summary format which are identical to the DoD Facilities Report formats with the following exception. Facilities in the OSD formats are listed by Common Category Codes for the Tri-Services (“OSD codes”) and any facility, which has not been assigned an OSD code, is excluded from the report. OSD codes are assigned automatically. When you select an Army Category Code using the facility Add or Edit window, a corresponding Common Category Code is assigned, if such exists. Not all Army codes have corresponding OSD codes.

- Project System Report – This report provides cost information on the currently selected project. All existing project information is printed on this report. Only one project is printed at a time. Costs are broken down by building system within each facility, if system costs are maintained in the database. Summary information for the project as a whole is also printed, including comparisons between the award cost, government estimate and the bids received. Notes are printed at project level, for each facility, and for each facility system. A system quantity, unit cost, cost per facility unit, total system cost and cost as a percent of total, are printed for each system.
- Project Subsystem Report – This report provides the same information as the Project Summary Report, but extends the reporting to cover subsystems for each facility system.
 

**Note:** The Subsystems report only includes those systems that have subsystems. If a project does not have any subsystems, the report will be empty.
- Bid Performance Report – This report provides comparisons of project award to government estimate, average of all bids to government estimate, and two similar comparisons to the program amount.

Reports can be summarized for Service (Army, Navy, etc.), Estimate Preparer (In-House vs. A/E), and/or the type of estimate (MCACES or Other). The total award, bid average, government estimate and program amount is reported for each project. The date of award and number of bids are also reported, if known.

Totals and averages are presented by installation, and for the total query or database depending on your selection.

## B. Adjusting Costs

### Purpose

To accurately compare costs when working with a query of similar types of facilities, you must have the cost data *normalized*. The Historical Analysis Generator normalizes costs by applying adjustment factors. You can view and/or change these adjustment factors as discussed below.

### About Normalizing Costs

An historical database typically contains cost data for projects from many years and locations and for many sizes. Also, the number of bidders on a project can have an effect on the final award cost.

*Normalized costs* are costs that have been adjusted to reflect the same date, location, facility size, and (optionally) the number of bidders on the project. You define the factors for these cost adjustments using the Normalize Cost Base window.

### Recalculating the Statistics

The summary statistics automatically re-compute when data in the View/Normalize Cost Base window has changed. However, the summary panel uses the current facility's unit of measure as a qualifying filter for inclusion in the summary. For example, if the current facility is measured in Square Yards, all items in the query with units other than SY will be excluded from the summary. You may wish to re-compute when you move the cursor to a facility record with a different unit if measure. Use the Repeat Cost Summary command to cause the summary statistics to re-compute when the Cost Base window has not changed.

### **C. Using the Crystal Report Writer**

HAG uses the Crystal Reports Print engine as its reporting mechanism. This is a “runtime” version of the Crystal Reports software, which uses standard Crystal Reports report files. If you have a copy of Crystal Report Writer Version 3.0, you can modify HAG’s report file formats to a limited degree and HAG will use your report formats in place of its own.