

Declass Review by NGA.

Frank F.

I believe item 7 a, b, c  
would be extremely useful —  
I believe 7d is beyond  
• their current instrumental  
capabilities — and there is  
nothing in the literature on  
• this problem — but "suffer  
little children, and forsake  
them not..."

This program appears  
far more realistic than

previously, and I suggest  
you consider forwarding  
it - or doing whatever!

Skin seal

RCS.

14 Dec

*Draft*

9 December 1965

Enclosure (a) Revised Statement of ~~Proposed~~ Items of Work of Proposed Task III "Analysis and Test of Viewing and Mensuration Equipment"

Item 1. Analysis and Test of Existing Viewer

Analyze the design and test the operation of an existing customer furnished viewer to develop procedures, measuring devices and standards. The following factors are typical of the aspects to be covered:

- (a) Examine film transport for speed, smoothness, accuracy and tracking.
  - (1) Review soundness of design approach.
  - (2) Determine suitability of available test films and procure samples for tests.
  - (3) Design and procure samples of special test films where necessary for special tests.
  - (4) Determine <sup>TYPE'S</sup> range and least count of test instruments needed.
  - (5) Make an error analysis of smoothness determination and where feasible make a power spectrum analysis of velocity.
- (b) Establish a review check list for such items as:
  - (1) Loading and loading diagrams
  - (2) Controls and markings
  - (3) Circuit diagrams
  - (4) Circuit breakers

- (5) High voltage interlocks
- (6) Roller alignment and bearing sticking
- (7) Personnel safety considerations
- (c) Review basic principles of structure design for:
  - (1) Sound geometry
  - (2) Good joints
  - (3) Properly sized and braced members
  - (4) Good structural damping
  - (5) Adequate well designed doors and access panels.
  - (6) Operating vibration levels
  - (7) Operating sound level
- (d) Examine and test illumination and optics for:
  - (1) Magnification
  - (2) Distortion
  - (3) Brightness distribution
  - (4) Brightness levels

Item 2 "Analysis and Test of Additional Equipments"

Analyze the design and test operation of such customer furnished equipment as is designated from time to time by the Technical Representative of the Contracting Officer. Effort will be directed toward establishing procedures, instructions, and specifying test equipment on first article tests so that customer or contractor technicians can readily test following production items.

Item 3 Explore New Mechanism and Control Concepts

Make engineering analysis, fundamental designs and breadboard tests of new mechanism and control concepts for viewing and mensuration equipment such as :

- (a) (a) Automatic Threading
- (b) Automatic frame location
- (c) Automatic data block reading *application to exploitation equip. of automatic data block reading devices*
- (d) Establishment of standardized design criteria for basic common components to promote interchangeability, rigidity and reliability.
- (e) Air platen of low noise and high stability.
- (f) More widespread application of liquid gate or liquid bath film cleaner.

Item 4 "Structure [Analysis and] Vibration Control"

Prepare analytical and test procedures, computation techniques and test instrument requirements for:

- (a) Amplitude criteria
- (b) Resonance and propagation
- (c) Damping
- (d) Vibration isolation
- (e) Transmissibility envelope
- (f) Power spectrum

Item 5 "Viewer Illumination Standards"

(a) Review standards and formulate procedures for test and for aiding in improvement of precision of specifications.

(b) Review illumination measuring equipment for usage, range and least count and evaluate applicability to viewing and mensuration equipment.

(c) Review the design procedures and performance criteria for lamp, condenser and projection lens for potential improvement in performance.

Item 6 "Computer/Viewer Augmentation"

Explore the feasibility of augmenting the role of the computer in relation to the projection viewer as an aid to the interpreter.

(a) Review availability and application of small special purpose computers to viewing and mensuration equipment with particular regard to economics and simplified programming.

Item 7 "Film Distortion and Format Temperature Study"

5 → (a) Heat Balance Analysis: Make literature search, analysis and, as necessary make measurements of film constants such as:

Heat capacity  
conductivity  
emissivity  
surface convection

for various transmission/absorption conditions.

(b) Design and conduct tests for measurement of film temperature at the film gate for various illumination conditions, consider and compare several approaches such as:

Calorimeter

thermocouple

temperature sensitive paints

strain gage

*Film distortion*  
(c) Dimensional changes: Review utility of available data

for determining dimensional changes of film as a function of:

tension

temperature

humidity

processing history

storage history

Design a test program as necessary in order to separate the elastic and inelastic changes.

(d) Grain Size: Review utility of available data to determine effect on grain size of film base and emulsion

processing

climatic conditions

aging

storage

Plan test program as necessary to obtain unavailable data.



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