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SANDIA SYSTEMATIC DECLASSIFICATION REVIEW	
CLASSIFICATION STAMP	
CLASSIFICATION CHANGED TO <u>U</u>	AUTHORITY: <u>R. B. Craney</u>
<u>Emilda Selph</u> <u>11-25-96</u>	RECORD ID: <u>97SN116</u>
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INTER-OFFICE MEMORANDUM

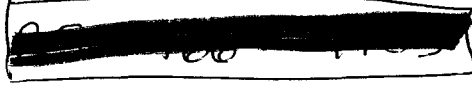
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DATE

TO: Paul J. Larson, Director
Sandia Laboratory

20 June 1949

FROM: E. W. Baldwin
Staff Member, SL AAD



SUBJECT: ADMINISTRATIVE PROGRAM AND PLANS

REF. SYMBOL: SL AAD

Major administrative problems encountered during Fiscal Year 1949 are several and are most directly a result of the remoteness of actual procurement, accounting, etc. under the present type of operation. Procurement procedures, particularly, are cumbersome for the reason that vendor negotiation and placement of orders are handled at Los Angeles, New York and, in some instances, Chicago. Deliveries are also cumbersome and expensive because of transshipment in many instances. The lack of reporting overall costs for Laboratory operation by the University Accounting Office has imposed a burden on Sandia in developing costs and estimating budgets and has, in many cases, necessitated considerable administrative work within Technical Departments. Due to the unusual growth of the Laboratory during this period, the procedures in use concerning warehousing of materials and property accountability are largely historical and not necessarily the most economic under present conditions. Considerable progress has been made during Fiscal Year 1949 with regard to establishment of wage administration policies. The establishment of a Contracts Liaison Department at Sandia has improved the procurement situation to a great extent. Plans have been formulated during the past few months concerning property accountability and material and warehousing which will accomplish some economy under the present method of operation.

Some time during the Fiscal Year 1950, it is anticipated that a new contractor will take over the operation of Sandia Laboratory which will necessitate the establishment of local procurement, accounting and general administrative controls. This will make it possible to accomplish major economies by reason of eliminating a number of steps made necessary by the present remote financial and fiscal administration. It is planned that the local administration will provide complete procurement facilities, cost and budget reports for the Laboratory as a whole and thereby eliminate a

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW	
1 st Review Date: <u>11-19-96</u>	Determination (Circle Numbers):
Authority: <input type="checkbox"/> ADC <input checked="" type="checkbox"/> ADD <u>W. Lays</u>	1 Classification Retained <u>U</u>
Name: _____	2 Classification Changed to _____
2 nd Review Date: <u>11/25/96</u>	3 Contains No DOE Classified Information
Authority: <u>ADD</u>	4 Coordinates With _____
Name: <u>W. Lays</u>	5 Contains UCAI? _____
	Comments: <u>OK for Approval</u>

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Paul J. Larsen.....#2
29 June 1949

considerable amount of the administrative functions now of necessity carried on by the individual Departments.

It is anticipated that this transition mentioned above will be accomplished during the Fiscal Year 1950 and that by the beginning of Fiscal Year 1951 sound economies will be accomplished by reason of experience gained immediately after the transition and requirements that may be made because of such experience.

E. W. Baldwin
E. W. Baldwin, Staff Member,
SL AAD

EWE/h
cc: C. W. Campbell

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MAJOR ACCOMPLISHMENTS AND PROBLEMS OF FY 1949

SECTION I

SLE
6-29-49

1. The LB weapon was released for Road issuance and/or storage.

During FY 1949 a policy was established in which the LB weapon was to be retired from active engineering work as soon as economically feasible. The manufacturing of major components was completed in November 1948. Complete Road catalogs of component and kit material were written and turned over to the proper departments for publication. Components and equipment were transferred to AFSWP in September 1948. Training of assembly teams was initiated in October 1948 and continued throughout the year. Seventeen of the twenty-one-volume manual series have been completed for publication.

2. 30 FM Bomb clean-up program completed.

Attendant to the cleaning up of the 30 FM bomb which was initially designed and developed by the Manhattan Project under the well-known extenuating circumstances that existed at that time, there have been many difficulties pertaining to thorough records relative to the design configuration, performance specifications and manufacture. As a result, this Laboratory has been required to gather from multiple sources isolated facts and integrate them into a final set of production drawings, specifications, manufacturing process and acceptance procedures. This work was finally accomplished within FY 49. Design development and production release has been accomplished on 26 items of test equipment and 7 items of handling equipment. Chicken Pox operation procedures, equipment, and manuals have been completed for this and other FM weapons. Since the initial design was not under this Laboratory's control, the whole clean-up process for the 30 FM weapon has been quite difficult.

3. 31 FM Bomb conversion program completed.

The MK III Mod 2 X-unit engineering development and production release was accomplished during this period. The conversion of the 30 FM to the 31 FM weapon involved replacement of the original MK II X-unit with a more reliable production type firing unit. The principle of firing of this new X-unit represents a note-worthy advance in safety to the logistic and tactical agencies. The elimination of many of the burdensome features of the 30 FM weapon is accomplished in the 31 weapon. Twelve (12) 31 FM weapons were drop tested in this period. Engineering release to production was accomplished. Four additional items of test equipment were designed and released to production. Out of a total of twelve (12) items of test equipment, ten (10) have been tested and approved for production, two (2) remaining to be approved following tests being currently conducted. Three (3) additional items of handling equipment were designed and released during this period, supplementing the original number assigned to the 30 FM. Completed weapon drawings, specifications, process procedures, and manuals have been turned over to the cognizant departments for publication.

SYSTEMATIC DECLASSIFICATION REVIEW	
1 st Review Date: 11-19-96	Deletion (Circle Numbers)
Authority: <input type="checkbox"/> AIC <input checked="" type="checkbox"/> ADD <i>W. Long</i>	1. Classification Rationale
Name: _____	2. Classification assigned to _____
2 nd Review Date: 11/25/96	3. Classification of Classified Information
Authority: ADD	4. Category _____
Name: <i>R. Brennan</i>	5. Comments (UC) _____
	6. Comments _____

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4. The 40 FM bomb design was completed during FY 1949 and released to Ford for production.

Sixty (60) full scale drop tests were made in the engineering proofing of this weapon. Thirty (30) of these bombs were dropped primarily to determine the satisfactory performance level of the firing and fuzing system and twenty-seven (27) were dropped primarily in connection with ballistic problems. Three (3) items of test equipment were designed and released for production. It is to be noted that much of the test equipment used on a 31 FM bomb is used with the 40 FM bomb, supplemented by the three (3) items specifically designed for the 40 FM. Twenty-seven (27) items of handling equipment have been completed and released during this period. Drawings, specifications, process procedures and manuals have been forwarded to the cognizant departments. Airborne nuclear insertor equipment for this bomb has been developed and is being tested.

5. The 41/42 FM Bomb program has been defined and engineering design work started.

41 FM firing and fuzing system has been defined and represents a considerable departure from the previous firing and fuzing systems employed in these implosion type weapons. For the first time, the evaluation giving the overall reliability of an atomic bomb in terms of the reliabilities of its major components was derived. This equation was for the 40 FM weapon and was used in evaluating its reliability. The principles evolved in making this derivation were used in determining the optimum fuzing system characteristics for the 41 FM bomb. Light weight case structures employing high strength aluminum alloys have been designed and are presently under experimental construction. Two (2) different fabrication methods were employed, namely, that used in aircraft fuselage designs and another which employs the forming methods presently used for the heavier steel cases. New handling equipment techniques, sway bracing in aircraft, and field handling studies have been developed as a means of establishing the specific design criteria required for a successful overall design. Initial drop tests indicate that some difficulty may be expected with the ballistic form under certain drop conditions.

6. TX-5 (50 FM Bomb) Program was initiated.

The Engineering Department established a new Division, SLE-7, for the purpose of spear-heading work on this bomb. This Division has worked with Los Alamos in establishing detailed design criteria for the TX-5 and has initiated studies pertinent to the bomb involving firing and fuzing systems, handling equipment, test equipment and associated problems. At the end of the fiscal year tentative schedules have been established which indicate that this program will be another very accelerated undertaking if present requirements maintain. Very serious considerations are being given to radical departures from previous design configuration philosophies in the structural portions of the subject weapon.

7. Pertinent Factors and Problems Associated with the above six items.

- a. Five thousand five hundred and sixty-six (5,566) drawings have been completed within the fiscal year and released to the cognizant agencies by this department.

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- b. A major aerodynamic and ballistic development has been brought into final form in the fins for the 40 FM weapon. This double wedge shaped fin represents a major departure from previous theories. This fin results in very good bombing characteristics. A considerable advance in the knowledge of factors pertaining to the dynamic stability of freely falling bombs has been evolved by this Department. This same dynamic factor, of which very little is actually known in aerodynamic and ballistic circles, is the crucial quantity remaining to be determined in the flight of the 41 FM and 50 FM weapons.
- c. Planning and scheduling of engineering activities have been functional during this fiscal year for the first time despite the necessity for the continuing crash programs. Manhour studies and allocations, including future requirement forecasts, have resulted in a considerable tightening up of the general tempo and accomplishments within the last year. The fruits of this planning are beginning to make themselves evident.
- d. A large engineering program was conducted in connection with inspection gages for the 31 FM and 40 FM bombs. Coincidentally, for the first time, typical production inspection procedures may exist. Prior to this, and because of the natures of the atomic weapons themselves, such production procedures were not possible.
- e. Development and liaison for atomic weapon installation in the following aircraft has been conducted:
- | | | |
|------|-------|--------|
| B-29 | XB-47 | P2V-3C |
| B-36 | XB-52 | AJI |
| B-50 | | A2JI |
- This modification is known as Saddletree.
- f. Specifications for land and water-based assembly areas and water supply, have been written and correlated with all concerned.
- g. Packaging and storage development investigations have been carried on relative to methods and materials for storage containers, dehumidification and storage areas, and road prototype packaging.
- h. Studies of the phenomena associated with hi-speed transients in the firing and fuzing systems have been conducted. The results of these studies have been carefully worked into the designs involved and now represent a satisfactory production accomplishment.
- i. Independent studies of proximity fuzing relative to the 31 FM and 40 FM bombs have indicated necessity for modification of the initially employed fuzing components (Archie). These modifications have been engineered and are currently being produced for experimental proofing.
- j. Development and evolution of the MK IV Stockpile-to-Target precepts was accomplished by the Department Manager.
- k. The Sandia Research and Development Board Chairmanship has demanded a great deal of the Manager's time.

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MAJOR PLANS OF FISCAL YEARS 1950/51

SLE
6/29/49

Section II

1. Complete the retirement of the LB.

It is anticipated that there will be a very pronounced tapering off of LB activities following the publication in July 1949 of the final manuals and storage instructions on this weapon. If this Laboratory is to assume any portion of the "Elsie" program, it is expected that it will replace, to some extent, the LB program.

2. Complete the engineering work on the 31 FM Bomb.

It is anticipated that there will be a continuation of the engineering work incident to Road and Surveillance functions. Engineering analysis of production and using agency reports in relation to performance is expected to continue. These findings are being worked into new designs.

3. Proceed with the design, development, and engineering proofing of the 41 FM Bomb.

It is anticipated that during the next two fiscal years the 41 FM Bomb will be completed, including the firing and fuzeing system slated for that bomb. The wind tunnel, firing range and drop tests are scheduled for this same period. This modification of the basic MK IV FM Bomb is currently associated with the replacement of the presently used steel case by a light weight aluminum case and structure. There is some question at the moment as to whether or not these dates recently established for this bomb will be met because they are so imminent.

4. Complete the design, development, and engineering proofing of the Abec Fuze.

Depending upon whether the development of this new fuze is completed before the third quarter of the fiscal year, it may or may not be employed during this period within the 41 FM Bomb. An intensive engineering development program is proceeding on this component. At an early date it is expected that this question will be resolved, thereby determining whether or not the new bomb fuzeing system including the Abec Fuze will be issued as a 41 FM or a 42 FM.

5. Design, development, and engineering proofing of associated equipment (Field Test Equipment & Handling Equipment)

It is anticipated that test and handling equipment for the 41 FM and 50 FM Bombs will be adequately defined for experimental production. A large portion of it should be proof-tested and released for production during this period.

6. Design, development and engineering proofing of components wherever possible. These are to include firing and fuzeing system components.

It is anticipated that there will be increased design activity in the Sandia

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Section II - Item 6 continued-Major Plans of Fiscal Years 1950/51 SLE 6/29/49

Laboratory Engineering Department itself rather than on an outside contract basis. Crash programs associated with crash production Road schedules during the past fiscal year have required that greatly expedited development activities be initiated and completed. The Engineering Department has expanded to that point at which it believed it is capable of conducting a major portion of this accelerated design engineering. Dependency upon outside contractors for basic firing systems should be lessened to a major degree within the next fiscal year.

7. Continue with the design, development and engineering proofing of light weight bomb cases.

In keeping with the military requirements recently set forth, this Department plans to continue design-development and proofing of light weight cases and structures employing light weight and high strength metals, glass laminates and other high strength to weight ratio materials and structures.

8. Continue design and development of the TL-5 (50 FM Bomb)

It is anticipated that approximately 80% of the basic development program on this weapon will be completed during the fiscal year 1950. There are many unknown factors in connection with this new weapon which may greatly attenuate the tentative dates for Road production. With a nominal amount of unpredictable troubles, the bomb may be ready for an engineering proofing period late in FY 1951.

9. Unassigned Projects

There will no doubt be at least a few as yet unannounced projects which can be expected to be assigned Sandia Laboratory at some time during the next two years. Conditions at that time may require additional people and facilities.

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Important Changes in program scope and direction during fiscal years 49, 50 & 51

This Engineering Department was initially established as an extension of the facilities at Los Alamos, and as such, shared Sandia's growing pains. We have presently evolved from a development engineering department, which had very little top policy definition on which to base its action, to that of an organization which can and has assisted in the formation of Laboratory policies. The initial clean-up of the old 1561 Fat Man pointed the way to a tighter organization though greatly expanded in relation to personnel and facilities. The previously defined scope of activities was practically all inclusive and as such was very difficult to implement, under the crash program, space limitation, and qualified personnel conditions that existed.

The formulation of a considerably more concrete Road production policy, supplemented by a more clearly defined technical employment policy will no doubt produce long-range benefits not yet fully achieved.

The W4 IV weapon was started at Los Alamos prior to the enlargement of Sandia Laboratory. This Department's work on this weapon has brought into focus the prospectus that must be used on the weapons that follow. The A1 FM weapon represents a transition point, whereas the T2-5 at the present time seems to represent the more nearly ultimate goal of relationships between Los Alamos and Sandia, if one thinks of this Engineering Department as an ordnance engineering department, in the usual sense of the word. Later programs can be expected to be consummated in a shorter period of time as the experience with this type of ordnance is fed back into the later designs. Military and tactical requirements forthcoming are expected to be considerably improved. Military long range plans and operations should result in a considerably better weapon which this Department can bring into being by the Engineering methods at its disposal.

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