AN ACCOUNT OF THE RETURN TO NUCLEAR WEAPONS TESTING BY THE UNITED STATES AFTER THE TEST MORATORIUM 1958-1961

WILLIAM E. OGLE

OCTOBER 1985

UNITED STATES
DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE

DOCUMENT UNCLASSIFIED WITH DELETIONS

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NVO-291

This document consists of 487 pages.

Copy [illegible] of 300 copies, Series A.

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Document Unclassified with Deletions.
Authority: Siebert Memo April 13, 1993

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DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW
1ST REVIEW-DATE: 11/2/97
AUTHORITY: DOE/NNC ADD
NAME: [illegible]
2ND REVIEW-DATE: [illegible]
AUTHORITY: ADD
NAME: [illegible]
1. CLASSIFICATION RETAINED
2. CLASSIFICATION CHANGED TO:
3. CONTAINS NO DOE CLASSIFIED INFO
4. COORDINATE WITH:
5. CLASSIFICATION CANCELLED
6. CLASSIFIED INFO BRACKETED
7. OTHER (SPECIFY): Additional

STATUS VERIFIED UNCLASSIFIED
AND APPROVED FOR PUBLIC RELEASE
Patricia M. Bodin 2/2/2000
Patricia M. Bodin Date

242054

[redacted]

DERIVATIVE CLASSIFIER

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NVO
024227

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Frontispiece:

The Kingfish event of Operation Dominic, showing the many different physical and chemical phenomena that follow a nuclear explosion at the "edge" of the sensible atmosphere.

The photograph is a 5-second exposure taken about 20 seconds after detonation from a KC-135 aircraft flying at about 11-km altitude a few hundred kilometers east of Johnston Island. North is to the right and south to the left in the print. The print color intensities have been modified in printing to show the different phenomena. In reality, the four principal phenomena (a) green dish, (b) red cap, (c) blue-white streamer, and (d) fireball had relative brightnesses of about 1, 10, 100, and 1000, respectively.

Ex.(b)(1)

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Ex.(b)(1)

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FOREWORD

On August 22, 1958, President Eisenhower announced that the United States was ready to begin test ban negotiations on October 31, and to suspend nuclear weapons tests on that date for one year while the negotiations proceeded. The suspension might continue from year to year depending on progress in other areas. A week later Premier Khrushchev agreed to the same date for negotiations, but not to a moratorium. In fact, Soviet testing, in abeyance since March, resumed on September 20 with two very large explosions, and continued until November 3. In compliance with the President's statement, no U.S. tests were conducted after October 30. No further tests then were performed by either nation until the Soviets burst forth with an astonishing 45 shots in 65 days beginning on September 1, 1961. Of these, 14 were above a megaton, and one yielded 63 megatons -- the largest bomb ever fired by any nation. The Soviet program gave every evidence of careful and deliberate preparation.

Following the 1958 test suspension, the United States dismantled most of the complex infrastructure required for its own nuclear test programs, both in Nevada and in the Pacific. Almost three years later when President Kennedy found it essential to United States interests to resume testing in response to the Soviet testing, the experience for America's testing community was technically agonizing, operationally painful, and economically very costly. The atmospheric component of test resumption had especially high political obstacles and costs.

In this book, which was eight years in preparation, William E. Ogle has provided a detailed description of the events of that period. The book does not argue for or against nuclear testing underground or in the atmosphere. Rather, it presents a comprehensive account of the major difficulties that attended U.S. test resumption in both of those environments after a period of total cessation. At the time of this writing, the United States (along with several other nations) still conducts tests underground, but it has become clear that this activity sustains only a small fraction of the capability that would be required if the national interest again made it necessary to conduct tests in the atmosphere.

Dr. Ogle's book is unique in several respects. It is the only detailed account by an "insider" of United States nuclear testing. The earlier development of testing methods and weapons technology is presented as necessary background for the reader. The author, in addition to accumulating and knowledgeably screening a vast collection of original documents from the period, personally interviewed more than 70 key political, technical, and operational professionals who participated in the events described in the main part of the book. The collection of data and interviews on which this book is based will be preserved intact in the archives of the Los Alamos National Laboratory. Since many of the original sources are no longer available, this archival material is unique and irreplaceable.

Bill Ogle's professional contributions to the nation's security encompassed the full range of development, testing, and use of nuclear weapons. He played a central role in the United States nuclear test program from the first explosion at Alamogordo in 1945 through the time of his death in May 1984. During the critical periods just before and following the moratorium he served as Scientific Deputy to the Military Commanders of the Joint Task Forces that were created to carry out U.S. tests in the

Pacific. As Test Division Leader at Los Alamos, he was responsible also for a major part of the underground test program in Nevada. At the time of his death he was an active participant in deliberations at the highest levels of the Departments of Defense and Energy. A scientist, teacher, and leader with exceptional management skills, Ogle instilled in his co-workers some of his own enthusiasm and his complete dedication to the task at hand. He inspired lasting respect and affection among all of us who knew him.

Ogle was a superb communicator, whether he was dealing with the President of the United States or with a craft worker at one of the test sites. As the individual with primary responsibility for public safety, he had an unusual ability to provoke other specialists into looking deeply and thoroughly before each test event at the range of its possible consequences. The book extensively documents the conscientious and untiring efforts made, under his guidance and using all available knowledge, to protect the safety of the public and especially of those potentially at risk in and near the testing sites.

The editorial board, which undertook to complete this study after the author's death, decided that it should be left largely to the reader to determine the relevance of this account to future U.S. actions. Underground testing has continued since the ratification of the 1963 Limited Test Ban Treaty, which prohibits testing in all other environments. The Soviet Union recently has proposed, and claims to be observing, a 5-month moratorium on underground tests; the Administration has rejected the Soviet proposal. At the moment it seems very unlikely that the United States will unilaterally initiate testing in the atmosphere, but the outlook is clouded by active missile-defense programs on both sides. The history presented here shows that the Soviets are capable of secret preparations for elaborate tests, while in this respect the U.S. is severely self-constrained.

Were a need to arise in the future as suddenly occurred in September 1961, the account contained in this book should be an invaluable asset to those called upon to respond. To ignore this history may well be to repeat it. As President Kennedy said in 1961: "The Soviet Union prepared to test while we were at the table negotiating with them. If they fooled us once, it is their fault, and if they fool us twice, it is our fault." Bill Ogle has left a vital record that deserves the attention of those who may in the future be responsible for the nation's security.

John S. Foster, Jr.
September 1985

PREFACE

Note to the Reader:

At the time of his death in May 1984, William E. Ogle--known to friends and colleagues across the nation as "Bill" or simply as "Ogle"--had worked for almost eight years on this historic account. Soon after his death, the four men whose names appear at the end of this preface--all long-term friends and associates of the author--offered their assistance to consolidate and publish this unfinished work.

As the institutional sponsor of the project, and with the concurrence of, and a generous offer of assistance by, the Director of the Los Alamos National Laboratory, I commissioned these four as an editorial board, charged with early completion of a manuscript which would preserve the integrity of Dr. Ogle's work and be a useful reference for those to whom his message was addressed.

With this publication I believe they have accomplished that task.

Las Vegas, Nevada
July 1985

Thomas R. Clark
Nevada Operations Office
U.S. Department of Energy

It was not without some trepidation that we approached the task of editing and publishing this volume. Starting with the Prologue, the material is presented in decreasing order of its state of completion at the time of the author's death. Westervelt and Peek had worked with him extensively from 1979 until his death, had assisted with writing, had reviewed most of the manuscript, and had provided detailed comments and suggestions. Brownlee and Ray had read much of the draft material and had given their suggestions also. All believed that the author was reasonably satisfied with the Prologue and Chapters I and II. Chapters III and IV were not so far advanced and presented the need for significant writing effort affecting both organization and content. Ogle had intended a Chapter V, with a working title of "Lessons Learned," but we found not even an outline of that chapter. In fact, it was not clear whether these were to be lessons learned by the author or by the nation (or perhaps by the reader?). Thus, we have chosen to retitle that element the Epilogue, and we accept full responsibility for it. The Index is ours also, although our task here was essentially mechanical--organizing and cataloging the results of an enormous amount of digging and collecting by the author.

We welcomed the constraint imposed by Tom Clark, regarding the integrity of Ogle's effort. It was a condition which we ourselves imposed from the outset. Each of us was at times tempted to "improve" Ogle's draft, but for the most part we have successfully resisted that temptation. When we have become aware of errors of fact we have corrected them, but we have avoided second-guessing the author's judgment. We offer these disclaimers along with our hope that the reader who knew and worked with Bill Ogle will find that most of what follows is presented in a familiar style.

As for our own credentials, all of us were associated professionally and personally with William Ogle for many years in a variety of circumstances and relationships. To each of us he was at times a mentor. Each of us had a specialized role in one or more aspects of the history that is told here. Individually and

collectively, we believe that we have been faithful to both the facts and the author's purpose.

Although Bill Ogle personally was a participant in most of the pertinent actions of the era upon which he reports, he was a disciplined writer and, therefore, a disciplined researcher. He mined the libraries and files of scores of offices and organizations and assembled a comprehensive and unique collection of official and authoritative papers. He interviewed at least 72 individuals, some several times, and preserved the original tape recordings of those interviews. The editorial board has recommended that a suitable classified repository be established at Los Alamos to house this collection and keep it intact and available for future researchers. Once that is done, this book should serve as a useful index and road map.

We will not presume to write the author's acknowledgments of assistance received, although we are quite certain of one name that would surely have been there. John C. Conrad, then Captain, U.S. Air Force, was detailed to work with Ogle from early 1974 through 1976. He assisted mightily with the research efforts, including notably the personal interviews. In our own behalf we wish to express appreciation to Janice Reeve Ogle for both encouragement and assistance in getting started and to the others in Ogle's Energy Systems Inc. family in Anchorage. Most of our work was done in Albuquerque, in space arranged for by Holmes & Narver, Inc. Milton Peek, who was our taskmaster throughout, had offices there and all of us appreciated the excellent working environment and hospitality. Getting the job planned, organized, and agreed upon was one thing; getting it done was another. Dave Buckner's assistance was invaluable in transcribing the original Energy Systems microcomputer floppy discs to a form usable by Holmes & Narver. Glenda Cremer Ponder was that indispensable person in any publishing venture who takes sentences, paragraphs, and pages, marginal notes and all, and turns them into a manuscript ready for the printer. Finally we wish to thank Tom Clark for authorizing and supporting the completion project.

What started out as a challenge and a duty has been indeed a labor of love. How many times, over these months, we have interrupted our deliberations to recall an Ogle mannerism, an expression, a statement of an evident truth. How many times his candor has given us pause. In a way that he truly would have enjoyed, there was a Bill Ogle presence in all our deliberations.

No one can predict when the nation may face a similar set of conditions in attempting to balance political imperatives against the harsh truths of science, or the constraint which must accompany diplomatic negotiations against the urgent need to be ready to move swiftly should negotiation fail. We--four among many who worked with William Ogle before, during, and after the test moratorium of 1958-1962--shared his view that this was an era the history of which should be preserved. His was an important contribution to making that record. For us it has been a rare privilege to help fulfill that purpose.

Albuquerque, New Mexico
September 1985

The Editorial Board
Roger Ray, Chairman
Robert Brownlee
H. Milton Peek
Donald Westervelt

INTRODUCTION

This work was commissioned by Major General Frank Camm, Director of Military Applications of the AEC, at the suggestion of Robert R. Brownlee, AEC leader of the Safeguard C (Readiness) program.

The intent was to relate the steps taken by the U.S. to return to nuclear weapons testing in late 1961 and 1962, after the three-year test moratorium of 1958 to 1961. Such a relation, in concept, would be useful to future planners were the termination of some similar hiatus (CTB, LTBT, etc.) to result in a sudden requirement to again renew or change drastically our testing procedures. Safeguard C of the LTBT requires that the U.S. maintain a "readiness to test in the prohibited enviroments." This work is intended as background reading for those who might have to carry out such a program.

However, very early on, the author concluded that a simple recounting of the steps taken in 1961 and 1962 would result in an inadequate understanding. It also seemed necessary to bring to the reader some of the background that set the stage for those actions. Thus, there is a rather long recounting of nuclear weapons testing problems, procedures, accomplishments, etc. prior to the actual meat of the work. The entire effort is broken into a Prologue, relating briefly the period of 1946 to 1958(?); Chapter I, giving the last six months of testing before the test moratorium went into effect; Chapter II, relating the period of the moratorium; Chapter III, relating the return to testing in Nevada; and Chapter IV, relating the return to testing in the Pacific. A Chapter V, giving some of the author's views on lessons learned, may or may not be produced.

This volume -- labelled Book I -- takes the reader through the moratorium. It is planned that Chapters III and IV, now in draft and on the word processor, will be issued in a year or two.*

Many people have helped in this effort. I am grateful to those many participants who subjected themselves to interviews and to those who were kind enough to read certain portions for accuracy of content, in particular John Malik, Don Westervelt, and Irv Woodward. My special thanks go to John C. Conrad who did the major work of documentation collection, and who assisted in producing much of the first draft material. Equally, I owe a great debt to Milton Peek who has patiently assisted me in editing the many versions. Lastly, I wish to thank N. E. Bradbury and A. D. Starbird for reading enough of the draft to conclude that they had no objections to its (classified) publication.

William E. Ogle
December 1983, Cabo San Lucas

*Ed. note: With the editors' decision to publish the entire work in one volume, this paragraph of the author's Introduction no longer obtains.