

COLD FUSION EXPERIMENTS AND THEORY DEVELOPMENT

***DOCUMENTATION OF DR. EDMUND STORMS'
LENR RESEARCH CAREER***

SANTA FE, NEW MEXICO

Stage 3 (Documentation): Project Report
Second Draft

Thomas Grimshaw, Ph.D.
Energy Institute
The University of Texas at Austin

Edmund Storms, Ph.D.



February 18, 2018

Contents

Summary	5
1 Introduction	7
1.1 Career Overview	7
1.2 Research Documentation Project	11
1.3 Project Components	12
1.4 Timelines	12
1.5 Interviews	12
1.6 Research Phases	13
1.7 Report Organization	13
1.8 Acknowledgments	14
2 Project Components	15
2.1 Publications	16
2.2 Unpublished Progress Reports	18
2.3 Lab Notebooks (Work History)	20
2.4 Electronic Data Files	21
2.4.1 Storms Computer (Round 1)	22
2.4.2 Storms Computer (Round 2)	22
2.4.3 ZIP Disks and CDs (Round 1)	23
2.4.4 CDs (Round 2), DVDs, and VHS Tapes	25
2.4.5 External Hard Drive	25
2.4.6 Floppy Disks	27
2.5 Hard Copy Records	29
2.6 Research Laboratory	32
2.7 LENR Library	35
2.8 Other Sources: Conferences and 2007 Book	36
2.9 Integrated Timeline	40
2.10 Interviews of Dr. Storms	40
3 Pre-LENR Career at Los Alamos National Laboratory	43
4 LENR Research Phases	47
4.1 Phase 1. Los Alamos National Lab (3/1989 – 8/1991)	47
4.2 Phase 2. Independent Investigation 1 (9/1991 – 12/1993)	52
4.3 Phase 3. ENECO (1/1994 – 2/1998)	54
4.4 Phase 4. Independent Investigation 2 (3/1998 – 6/2000)	56
4.5 Phase 5. Lattice Energy (7/2000 – 2/2006)	59
4.6 Phase 6. Independent Investigation 3 (3/2006 – 2/2007)	64
4.7 Phase 7. Kiva Labs (3/2007 – 3/2012)	65
4.8 Phase 8. Independent Investigation 4 (4/2012 – 12/2015)	68
5 Future Opportunities and Next Steps	71
6 Conclusions: Dr. Storms’ Contribution to Eventual LENR Realization	73

Appendix A. Project Methods.....	75
A-1 Information Retrieval.....	75
A-2 File Management and Storage	76
A-3 Reporting	77
Appendix B. Publications Timeline.....	87
Appendix C. Unpublished Progress Reports Timeline.....	87
Appendix D. Work History Timeline	87
Appendix E. Electronic Data Files Timelines.....	87
E-1. Storms Computer Files (Round 1): 41SF1	87
E-2. Storms Computer Files (Round 2): 42SF2.....	87
E-3. ZIP and Round 1 CD Electronic Files: 43ZCD	87
E-4. Round 2 CDs, DVD Files and VHS Tape: 44CVD	87
E-5. External Hard Drive Files: 45EHD	87
E-6. 3–1/2 Inch Floppy Files: 46FLD.....	87
Appendix F. Hard Copy Records.....	87
F1. Hard Copy Records Timeline	87
F2. Scanned Contents of Hard Copy Files, Tubs I to VIII	87
F3. Scanned Contents of Hard Copy Files, Tubs A to F.....	87
Appendix G. LENR Library Timeline	87
Appendix H. Timelines of Other Components	87
H-1. ICCF Conferences	87
H-2. Dr. Storms’ 2007 Book.....	87
Appendix I. Integrated Timeline.....	87
I-1 Integrated Timeline: Project Components (Except Work History).....	87
I-2 Integrated Timeline: Work History	87
Annex I. Collected Works (Publications).....	88
Annex II. Collected (Unpublished) Progress Reports.....	88
Annex III. Interviews of Dr. Storms (Annotated).....	88
III-1. Round 1.....	88
III-2. Round 2.....	88
III-3. Round 3.....	88
Annex IV. Project Memos	88
Part 1. Onsite Visits 1 to 7, Components 10 to 30.....	88
Part 2. Onsite Visits 1 to 7, Components 40 to 97.....	88
Part 3. Onsite Visits 8 to 12	88

Summary

Dr. Edmund Storms was one of the first researchers to follow up on the cold fusion claims of Martin Fleischmann and Stanley Pons in March 1989. He has continued his cold fusion (now widely referred to as low-energy nuclear reactions, LENR) research in the years since, first in his position at Los Alamos National Laboratory (LANL) and then in his home laboratory in Santa Fe, New Mexico. His work has included both laboratory experiments and development of explanations of the LENR phenomenon.

During his 29 years of investigations, Dr. Storms has developed one of the most extensive LENR research records in existence. Much of this work is available in the public realm through his publication of papers and presentations at conferences. There is in addition an extensive body of research results that are in Dr. Storms' private files. A project has been undertaken to compile the publicly-available documents and to capture, organize, store, and document the private records. The initiative, termed the "Storms LENR Research Development Project" is being performed by Dr. Storms and Dr. Thomas Grimshaw, who also has LENR interest in the area of public policy.

The Project has been accomplished in three stages – information collection, organization, and documentation. Stage 1 began in August 2015, and the second draft of the report for this stage was completed on April 18, 2017. The second draft of the Stage 2 report was submitted to Dr. Storms on June 3, 2017. This Stage 3 document, the overall report for the Project, describes the components of the records located, sets forth the timelines of the individual and combined components, and characterizes the phases of Dr. Storms' LENR research career.

The LENR research materials consist of a number of components: publications, unpublished progress reports, laboratory notebooks, electronic data and other files, hard-copy materials, the research laboratory, a LENR library, and interviews of Dr. Storms. The integrated timelines for these components indicate his research can be organized by the entities and individuals he was working with or receiving support from: LANL, ENECO (Charles Becker), Lattice Energy (Lewis Larson), and KivaLabs (Brian Scanlon). Dr. Storms has enjoyed the sponsorship from a number of supporters having various motivations such as scientific advances and commercial success. Periods of independent investigation took place between each of these times (and after the last one), resulting in a total of eight phases from 1989 through 2015.

Dr. Storms has worked diligently in the LENR field since its announcement. He has made many contributions with both sophisticated experiments and advanced explanations of the LENR phenomenon. He has written two books and he has published many papers as well as unpublished reports on experimental findings and their interpretation for creative explanation. He has developed a sophisticated home laboratory in which he has conducted experiments employing the methods known to produce LENR using its various signatures, including excess heat, radiation, tritium production, and elemental transmutation. His novel explanations, such as the nanocrack and hydroton idea for nuclear reactions, conform generally to current scientific understanding but also push into the frontiers of new knowledge. He has developed and maintains perhaps the most complete library of LENR publications in existence today.

Dr. Storms has served as a vital member of the LENR research community from the very beginning. He has provided intellectual and other support to other investigators, and he has been willing to share his expertise and insight freely. The future of humankind may well depend on achieving LENR and realizing its benefits as a clean, abundant, and inexpensive source of energy. Society will owe a great deal to Dr. Storms when LENR becomes a reality it is widely deployed as a source of energy.

1 Introduction

Cold fusion was announced by Dr. Martin Fleischmann and Dr. Stanley Pons at a press conference at the University of Utah in March 1989. The potential benefits of cold fusion (now widely referred to as low energy nuclear reactions, LENR) as a new source of energy were quickly realized. Numerous attempts have been made worldwide to confirm the LENR claim. Dr. Edmund Storms, one of the earliest researchers to follow up, has continued to conduct research and develop explanations in the 29 years since the announcement. As a consequence, he has created one of the most extensive LENR research records in existence. A photo of Dr. Storms that was taken in about 2000, possibly in conjunction with an interview by Eugene Mallove¹, appears in Figure 1-1.



*Figure 1-1.
Dr. Storms in about 2000*

1.1 Career Overview

Dr. Storms' roots are in Pennsylvania, where he received his undergraduate degree. He then went to graduate school at Washington University in St. Louis and received his PhD in

¹ Mallove, E., 2000. Interview of Edmund Storms. Storms LENR Library, CD in Envelope.

radiochemistry². He was employed part-time at Los Alamos National Laboratory (LANL) during his graduate work, and he became a permanent employee in about 1956 after completing his studies. His main research area at LANL was high-temperature materials, such as the carbides and nitrides³. His extensive research in materials provided a solid foundation for his subsequent LENR investigations. Dr. Storms retired from LANL in 1991, but continued as a consultant until 1993. More detail on his research career at LANL before he became involved with LENR is provided in Section 3.

LANL was one of the earliest and most preeminent research organizations to attempt replication of LENR after the 1989 announcement. No fewer than eight research teams conducted different types of experiments for replication. Dr. Storms took an immediate interest in the phenomenon and began research within a few weeks. He focused initially on tritium production as a signature. With the assistance of Carol Talcott, an expert in palladium hydride chemistry (and later Dr. Storms' wife), more than 250 electrolytic cells were explored⁴. Anomalous levels of tritium were observed in 13 of the 250 cells. Later at LANL, Dr. Storms conducted additional research with electrolytic cells and a calorimeter, measuring production of excess heat as the LENR signature. Positive results were found in two of three samples investigated.

Dr. Storms led one of two LANL teams that had success in replicating LENR. During this time he authored or co-authored a number of papers and publications, and he gave testimony on LENR to the U.S. Congress in 1993⁵. The other successful team was led by Tom Claytor, who used primarily tritium as the signature of LENR. It is interesting to note that the leaders of the two successful teams have continued to research LENR in their private labs to this day.

After he retired from LANL and took a break from his research activities to build his home in Santa Fe with his wife, Carol, Dr. Storms began LENR experiments at his private laboratory.

² Storms, E.K., 1957. A Preliminary Study of the Effect of Temperature on High-Vacuum Electrical Conduction. Dissertation. Washington University, Department of Chemistry.

³ “Research at Los Alamos National Laboratory Prior to LENR Involvement”. Memo to Edmund Storms from Tom Grimshaw, September 26, 2015.

⁴ Storms, E.K., 2007. The Science of Low Energy Nuclear Reaction: a Comprehensive Compilation of Evidence and Explanations about Cold Fusion: Singapore, World Scientific Publishing, p. 10.

⁵ Storms, E., 1993. Statement of Dr. Edmund Storms before Congress. in Hearing Before the Subcommittee on Energy of the Committee on Science, Space, and Technology, U. S. House of Representatives, One Hundred Third Congress, First Session. Washington, C.D.: U.S. Government Printing Office. p. 114.

This research in his home lab has continued up to the present day. During this timeframe, he has also made many contributions to explanation of the LENR phenomenon.

Dr. Storms' laboratory was initially set up in the main building of his home, but was subsequently moved to the annex building, where it is currently located. Among the assets of his laboratory are a scanning electron microscope (SEM) with energy-dispersive x-ray (EDX) spectroscopy capability, mass spectrometers, and an optical microscope, as well as a complete shop for constructing experimental apparatus, including metal machining and glass working. The SEM occupies a large room in the main building.

Dr. Storms has conducted many types of LENR experiments, utilizing most of the methods for achieving the effect, including the Fleishman-Pons approach (electrolytic cells) and the gas discharge and gas loading methods. He has also designed and constructed many kinds of calorimeters for measuring excess heat. Although he has collaborated with many individuals and organizations, for the most part he has conducted his private research on an individual basis. Dr. Storms has enjoyed the support of a number of different sponsors during the years of his LENR research.

Dr. Storms' most prominent publications are his two books published in 2007⁶ and 2014⁷ (Figure 1-2). He has also documented the results of his research in other publicly-available publications and in unpublished progress reports. About 125 publicly-available publications have been located, and some 111 unpublished reports have also been identified. A principal venue for reporting his results has been the conferences dedicated to LENR, the International Conferences on Cold Fusion (ICCFs), of which Dr. Storms attended all but three of the 18 conferences at locations in many countries from 1990 to 2015.

⁶ Storms, E.K., 1997. *The Science of Low Energy Nuclear Reaction: a Comprehensive Compilation of Evidence and Explanations about Cold Fusion*: Singapore, World Scientific Publishing.

⁷ Storms, E.K., 2014. *The Explanation of Low Energy Nuclear Reaction: an Examination of the Relationship Between Observation and Explanation*. Concord, NH. Infinite Energy Press.

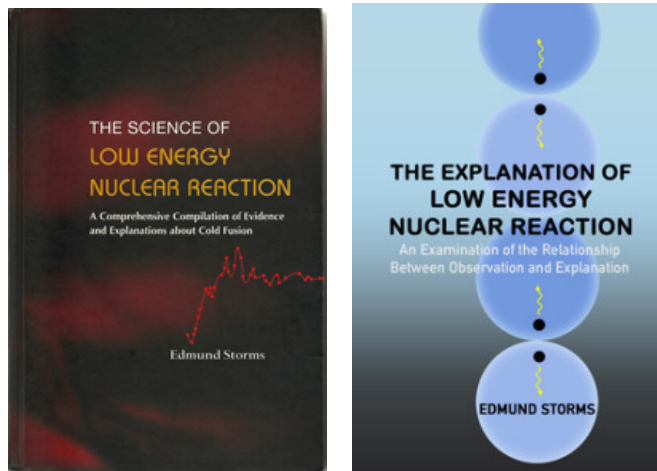


Figure 1-2.
Storms' 2007 and 2014 LENR Books.

Dr. Storms has accumulated one of the best libraries of LENR publications, books, and related materials in the world. The library contains more than 5000 electronic files and at least 1700 hard-copy papers (some of which are also in the electronic file collection). The electronic files are maintained in Endnote® by Dr. Storms, and the paper copies are on bookshelves in his office in Santa Fe. His publication collection also formed the "kernel" of an online library, LENR-CANR.org, which was started in about 2002 by Jed Rothwell and Dr. Storms⁸.

Dr. Storms was honored (along with Michael McKubre) by Wired Magazine in 1998 as one of the 25 people in the US making a significant contribution to new ideas. As noted above, with few exceptions Dr. Storms has participated in the ICCF conferences. In the 2005 conference he was awarded the Preparata Medal, the most prestigious award of the LENR field, by the International Society of Condensed Matter Nuclear Science (Figure 1-3). In 2013 he received a Distinguished Scientist Award from the University of Missouri for his contributions to the LENR field.

⁸ Rothwell, J., and E. Storms, 2003. The LENR-CANR Website, Its Past and Future. Proceedings of ICCF-10, p. 939-942. August.



Figure 1-3.

Dr. Storms' Preparata Metal, Which He Received in 2005. Photo Taken April 2016.

1.2 Research Documentation Project

As a consequence of his many years of LENR research, Dr. Storms has developed a large body of experimental data along with his publications and unpublished reports. The data and reports currently exist in Dr. Storms' private collection of electronic and hard-copy files. A project has been undertaken with the assistance of Dr. Thomas Grimshaw to collect and organize Dr. Storms' research files and make them more readily accessible. The initiative is referred to as the "Storms LENR Research Documentation Project" ("SLRDP" or "Project").

The Project is being conducted in three stages – information collection, organization, and documentation. As progress is made, memos are prepared to document the results. A report is being prepared for each stage. A second draft of the Stage 1 report was completed on April 18, 2017⁹. The Stage 2 second draft was submitted to Dr. Storms on June 3, 2017¹⁰. Work on the Project began in August 2015¹¹ when Dr. Grimshaw made his first onsite visit for information collection. The "cutoff date" for the Project is December 31, 2015. The information obtained and the reports, memos, and other documents prepared for the Project are available on a dedicated

⁹ Grimshaw, T., and E. Storms, 2017. Cold Fusion Experiments and Theory Development: Documentation of Dr. Edmund Storms' LENR Research Career, Santa Fe, New Mexico. Stage 1 (Information Collection) Report, Second Draft. April 18.

¹⁰ Grimshaw, T., and E. Storms, 2017. Cold Fusion Experiments and Theory Development: Documentation of Dr. Edmund Storms' LENR Research Career, Santa Fe, New Mexico. Stage 2 (Organization) Report, Second Draft. June 3.

¹¹ The Project was actually initiated in the Spring 2015 ("Professional Biography Initiative: Next Step". Memo to Ed Storms from Tom Grimshaw, June 10, 2015), but substantive effort began in August.

storage device, which is a 256GB flash drive that accompanies this report.

1.3 Project Components

A number of information sources has been identified for the Project. The information includes both paper files and electronic media and files. Most of the sources are at Dr. Storms' home laboratory, in his office, and in onsite storage areas. Additional sources are Dr. Storms 2007 book and LENR-related conferences he has attended. The information has been organized into Project Components as shown below:

1. Publications
2. Unpublished Progress Reports
3. Work History
4. Electronic Data Files
 - a. Storms Computer Files (Round 1)
 - b. Storms Computer Files (Round 2)
 - c. ZIP and Round 1 CD Electronic Files
 - d. Round 2 CDs, DVD Files and VHS Tapes
 - e. External Hard Drive Files
 - f. 3-1/2 Inch Floppy Files
5. Hard Copy Records
6. Research Laboratory
7. LENR Library
8. Other Sources (2007 Book, Conferences)

1.4 Timelines

The information in the Project Components has been organized by preparing timelines that include events, milestones, and other items in date order for each Component. The individual timelines were then assembled into an integrated timeline, which was sorted by year and month to provide insight into the contemporaneous research and other activities that were taking place as indicated by all the Components combined.

1.5 Interviews

Discussions with Dr. Storms regarding his LENR research over the years since 1989 announcement provide an additional source of information for the Project. Three rounds of interviews were conducted in April 2016 (8 sessions), March 2017 (11 sessions), and June 2017 (15 sessions). A total of more than 22 hours of interviews was recorded and transcribed. The

printed transcriptions were reviewed to add annotations, fill in missing information, and correct names and spelling errors.

1.6 Research Phases

The Integrated Timeline described above provides the basis for delineating the Phases of Dr. Storms' LENR research career. These have been identified as shown below.

1. LENR Work at Los Alamos National Laboratory
2. Independent Investigation 1
3. ENECO
4. Independent Investigation 2
5. Lattice Energy
6. Independent Investigation 3
7. Kiva Labs
8. Independent Investigation 4

The career Phases are described based on the information in the Project Components. For each Phase, the overall activities that took place, the publications and unpublished progress reports prepared, and the research record that has been documented are described.

1.7 Report Organization

This Phase 3 report follows the organization set forth above. Following a description of the Project Components, a characterization of Dr. Storms' long career as a researcher at LANL before he began LENR investigations is provided. The eight Phases of his LENR research are then described, with emphasis on the contents of the Project Components in each Phase.

Appendix A presents the methods used to accomplish the Project. The individual timelines of the Project Components are in Appendices B to H, and an integrated timeline is in Appendix I.

Annexes I to IV contain the Collected Works (Publications), Collected (Unpublished) Progress Reports, Annotated Interviews of Dr. Storms, and copies of the memos prepared to document the findings of the Project as it progressed.

The electronic files on the Project storage device have been copied into the storage device using the following organization:

Stage 1	Other Categories
Stage 2	Onsite Visit #8
Stage 3	Onsite Visit #9
Project Components	Onsite Visit #10
Project Memos	Onsite Visit #11
Interviews	

1.8 Acknowledgments

The authors wish to extend their gratitude particularly to Carol Storms and JoAnne Grimshaw. Carol participated in the pursuit of LENR with Dr. Storms in the early days of the field. For this Project, she was not only a gracious hostess for the onsite visits, but was also a valuable source of information and perspectives from her early experience in LENR research. JoAnne Grimshaw also provided support both on-site during the visits and in the Austin-based part of the Project. She also reviewed many of the Project reports.

Tom Claytor and Malcolm Fowler, both participants in preparation of proposals that preceded the Project, were also valuable resources for information about LENR development, particularly for the early efforts at LANL^{12,13,14}. Acknowledgment is also given to the managers of the Energy Institute for supporting a LENR initiative within the organization. Thanks especially go to Fred Beach, Assistant Director, for his interest in LENR and for serving as "mentor" for the Project and other activities at the Energy Institute such as energy policy toward LENR.

¹² The Project was preceded by initiatives by Dr. Storms and Dr. Grimshaw to establish a new laboratory in Santa Fe separate from Dr. Storms' home lab. These initiatives resulted in two versions of a proposal (see next two footnotes), both in collaboration with Dr. Tom Claytor. Dr. Claytor, like Dr. Storms, is a retiree from Los Alamos National Laboratory who operates his own private LENR lab. It is located in White Rock, NM. Funding for the two initiatives has not yet been acquired.

¹³ Storms, E., T. Grimshaw, and T. Claytor, 2013. Proposal for a Santa Fe LENR Research Laboratory, Los Alamos and Santa Fe, New Mexico. December.

¹⁴ Claytor, T., E. Storms, M. Fowler, and T. Grimshaw (LENRGY Collaboration), 2015. Investigation of LENR for Energy Production. March.

2 Project Components

The records collected for the Project include both publicly-available publications and unpublished information such as laboratory notebooks, electronic data files, hard-copy files, and other materials. As noted in Section 1, the Project has been organized into the Components based primarily on the source of information. LENR-related conferences attended by Dr. Storms and information from Dr. Storms 2007 book are also included. The final Component is a set of interviews of Dr. Storms that were conducted in three episodes or “Rounds”. The Components are shown below with abbreviations for each one.

1.	Publications	10PUB
2.	Unpublished Progress Reports	20UPR
3.	Work History	30WRK
4.	Electronic Data Files	40EDF
4a.	Storms Computer Files (Round 1)	41SF1
4b.	Storms Computer Files (Round 2)	42SF2
4c.	ZIP and Round 1 CD Electronic Files	43ZCD
4d.	Round 2 CDs, DVD Files and VHS Tapes	44CVD
4e.	External Hard Drive Files	45EHD
4f.	3–1/2 Inch Floppy Files	46FLD
5.	Hard Copy Records	50HCR
6.	Research Laboratory	60RSH
7.	LENR Library	70LLB
8.	Other Components (Conferences, 2007 Book)	80CON, 90BOK
9.	Interviews	95INT

The timelines for the Project Components were prepared with a consistent format of six columns as shown below:

- Component (Comp)
- Number (No)
- Year
- Month (Mon)
- Item or Event
- Notes

This uniform format was established so that the timelines could readily combined and sorted. The year associated with each item in the timeline has been assigned for most of the items. Where available, the month is also shown. The number “13” is given as the month when the

actual month cannot be determined. This assignment is made so that the items or events having the actual month appear before the items for which the year (but not the month) is known.

Because of variations in the contents of the Components, there are differences in the entries of the last two columns (Item or Event and Notes). And because of differences among the Components, the level of detail also varies somewhat. The contents for the Components are listed in a series of timelines – sorted by year, then month, and then Component – in Appendices B to G (The Timelines for the two parts of Component 8 are provided separately). A timeline for the Interviews Component has not yet been prepared. Summaries of the other Components are provided below.

2.1 Publications

As noted in Section 1, Dr. Storms' principal publications are his two books, and he also contributed to the LENR field by reporting the results of his research in publicly-available publications. About 125 papers were prepared from 1989 to 2015^{15,16,17}. The timeline for the Publications is in Appendix B. PDF copies of the publications (Component 10PUB) have been placed in the Project storage device. The publications have also been assembled into "Collected Works" (three volumes) in both electronic and hard-copy form^{18,19,20} (Figure 2-1). The Collected Works are in Annex I, and PDF copies are on the Project storage device. On average Dr. Storms authored a remarkable four to five papers per year.

¹⁵ "Collection of Papers and Publications". ¹⁶ Memos to Edmund Storms from Tom Grimshaw, September 16 to 26, 2015.

¹⁶ "Summary of Collection of LENR Papers and Other Items". Memo to Edmund Storms from Tom Grimshaw, September 26, 2015.

¹⁷ "Collection of LENR Papers and Other Items: Consolidated Files". Memo to Edmund Storms from Tom Grimshaw, November 29, 2015.

¹⁸ "Collected Works of Cold Fusion (LENR) Papers". Memo to Edmund Storms from Tom Grimshaw, March 4, 2016.

¹⁹ "Collected Works of Cold Fusion (LENR) Papers: Update". Memo to Edmund Storms from Tom Grimshaw, April 24, 2016.

²⁰ Edmund Storms LENR Research Papers, Collected Works, 3 Volumes. April 2016.



Figure 2-1.
The “Collected Works” Volumes of Dr. Storms’ LENR Research Publications

Although some of the publications appeared in mainstream peer-reviewed journals, most were in

the dedicated LENR literature because most mainstream journals do not accept LENR papers. Dr. Storms also gave presentations at the ICCF conferences that he attended from 1999 to 2013 (ICCF 1 to 18). In most cases a paper also appeared in a conference proceedings. The conferences attended by Dr. Storms are described in Section 2.8 below. Other frequent venues were Infinite Energy and the Journal of Condensed Matter Nuclear Science.

2.2 Unpublished Progress Reports

During the same timeframe that he was authoring publicly-available publications, Dr. Storms was also documenting his LENR research results in unpublished internal reports^{21,22,23,24,25} (Component 20UPR). These reports were often prepared to show research results to sponsors of his work. Approximately 111 documents, which are listed in Appendix C in timeline format, have been located and placed on the Project storage device. They span a range from 1995 to 2015. Approximately 18 files in legacy word processor format (FullWrite) are not accessible and have not yet been included in the Project²⁶. A "Collected Progress Reports" (Figure 2-2)²⁷ has also been prepared in electronic and hard-copy form in a similar manner to the Collected Works for the Dr. Storms' publications described in the previous section. The paper copy is in Annex II, and PDF files are on the Project storage device.

²¹ "Progress Reports in LENR Data File Collection". Memo to Edmund Storms from Tom Grimshaw, January 11, 2016.

²² "Progress Report Candidates Found in Data Files from LENR Experiments". Memo to Edmund Storms from Tom Grimshaw, March 23, 2016.

²³ "Progress Reports and Related Documents in Files Received from ZIP Disks and CDs". Memo to Edmund Storms from Tom Grimshaw, March 31, 2016.

²⁴ "Progress Reports and Related Documents in Two Datasets for the Storms LENR Research Documentation Project". Memo to Edmund Storms from Tom Grimshaw, May 21, 2016.

²⁵ "Progress Reports and Related Documents in Two Datasets for the Storms LENR Research Documentation Project (Update)". Memo to Edmund Storms from Tom Grimshaw, May 28, 2016.

²⁶ "Assuring Access to Electronic Files Generated in LENR Research: Not Yet Achieved". Memo to Edmund Storms from Tom Grimshaw, September 25, 2016.

²⁷ Edmund Storms LENR Research Papers, Collected Progress Reports, 2 Volumes. May 2016.



*Figure 2-2.
The Volumes of Ed Storms' Unpublished "Collected Progress Reports"*

2.3 Lab Notebooks (Work History)

As Dr. Storms performed his LENR experiments, he kept careful records in laboratory notebooks. Ten notebooks covering the period June 1995 to November 2015²⁸ have been added to the Project as the Work History (30WRK) Component²⁹. They are listed below and are shown in Figure 2-3³⁰. The LENR laboratory where the work was done is described in Section 2.6.

<u>No.</u>	<u>Period Covered</u>	<u>Topic</u>	<u>Notebook Description</u>
1	JUN95 – DEC96	Electrolytic Cells	Black w/ maroon trim. “Shaw’s”.
2	JAN97 – MAR98	Electrolytic Cells	Reddish, plain. “Blueline”.
3	DEC98 – SEP01	Electrolytic Cells	Maroon, mottled. No Brand.
4	SEP01 – JAN04	Electrolytic Cells	(Case Effect). Black & white mottled. “Mead”.
5	FEB04 – SEP05	Electrolytic Cells	Black. “Cambridge Executive”.
6	AUG04 – JUN08	Gas Discharge	Black. “Cambridge Executive”.
7	FEB08 – JUL09	Gas Loading	Blue w/ black trim. “Office Depot”. “Records”.
8	AUG09 – FEB14	Gas Loading	Blue-green w/ black trim. Tall vertical. “Office Depot”.
9	MAY14 – MAY15	Gas Loading	Tall vertical. Dark blue. “Foray”.
10	1AUG15 – 15NOV15	New Calorimeter	Black with white stripe. “Foray”.

The “overlap” of notebooks 5 and 6 from August 2004 to September 2005 occurred because two different types of experiments (electrolytic cells and gas discharge) were taking place during the same timeframe.

The notebooks were carefully reviewed by Dr. Storms from August 2015 to January 2016. During this review, he summarized the lab activities as one-line entries in a spreadsheet^{31,32}. The resulting file has more than 2750 lines in the file. The spreadsheet is on the Project storage device and is shown as a timeline table in Appendix D. The lab notebooks are in storage tubs created for the Project (see Appendix A).

²⁸ Dr. Storms has continued to perform experiments and record the results in lab notebooks since November 2015, but the cutoff date for the Project is the end of 2015.

²⁹ “LENR Lab Notebook Inventory”. Memo to Edmund Storms from Tom Grimshaw, August 18, 2015.

³⁰ “LENR Work History (Lab Notebooks): Status Update with Photo and Audio Recordings”. Memo to Edmund Storms from Tom Grimshaw, April 20, 2016.

³¹ “LENR Work History (Table Refinements and Additions after Final Submittal)”. Memo to Edmund Storms from Tom Grimshaw, January 18, 2016.

³² “Stage 1 Report: LENR Work History”. Memo to Edmund Storms from Tom Grimshaw, February 19, 2016.



Figure 2-3.

Ed Storms' LENR Laboratory Experiment Notebooks. Photo Taken April 2016.

2.4 Electronic Data Files

As Dr. Storms performed LENR experiments and made entries in the lab notebooks, the data generated were recorded in electronic files^{33,34}. These files were obtained from Dr. Storms' computer and from legacy media located in his office. In addition to experimental data, these files include published papers, progress reports, copies of emails, photos of lab equipment and experimental setups, and other files related to LENR research. The files comprise the Electronic Data Files (40EDF) Component of the Project. It consists of six subcomponents (referred to as Components in this report) as shown below.

- Storms Computer Files (Round 1), 41SF1
- Storms Computer Files (Round 2), 42SF2
- ZIP Disks and Round 1 CDs, 43ZCD

³³ "Inventory of Data Files Accompanying Work History". Memo to Edmund Storms from Tom Grimshaw, December 28, 2015.

³⁴ "Detailed Inventory of Data Files from LENR Experiments". Memo to Edmund Storms from Tom Grimshaw, January 19, 2016.

- Round 2 CDs, DVDs, and VHS Tapes, 44CVD
- External Hard Drive, 45EHD
- 3-1/2 Inch Floppies, 46FLD

The electronic files obtained from Dr. Storms' computer and the legacy media are on the Project storage device and are included in timeline format in Appendix E. Some of the files cannot be accessed because they were created by software that is no longer available (e.g. FullWrite)³⁵. The Components in this category are described below. The ZIP disks, CDs, DVDs, VHS tapes, external hard drive, and 3.5-inch floppy disks have been placed in the hard copy storage tubs as described in Appendix A³⁶.

2.4.1 Storms Computer (Round 1)

Dr. Storms provided files from his current computer in two episodes or “Rounds”. The abbreviation SF (for "Storms Files") are used for both Rounds. The files obtained in Round 1 (41SF1 files) are in five folders as shown below.

- OLD DATA
- DATA
- Letts Data
- SEEBECK CALORIMETER STUDY
- Study using new calorimeter

The timeline for the SF1 files is in Appendix E1.

2.4.2 Storms Computer (Round 2)

The files added to the Project by Dr. Storms from his computer in Round 2 (subcomponent SF2) include the folders shown below³⁷.

- (4/17, 29-16)
- 9/7/15 A
- Current Science_files
- ICCF-19

³⁵ “Assuring Access to Electronic Files Generated in LENR Research: Not Yet Accomplished”. Memo to Edmund Storms from Tom Grimshaw, September 25, 2016. A search is underway to find a way to access the information.

³⁶ “Additions to and Reorganization of Electronic Media in Project Storage Tubs”. Memo to Edmund Storms from Tom Grimshaw, October 27, 2016.

³⁷ “Preliminary Inventory of Folders and Files Stored on Your Current Computer as Provided on August 10, 2016”. Memo to Edmund Storms from Tom Grimshaw, April 9, 2017.

- Reports (gas discharge)
- SEEBECK CALORIMETER STUDY
- Study using new calorimeter

The folders “SEEBECK CALORIMETER STUDY” and “ Study using new calorimeter” appear to be the same as the folder in the 41SF1 Component. The timeline for the 42SF2 files is in Appendix E2.

2.4.3 ZIP Disks and CDs (Round 1)

Files in two sets of media (4 ZIP disks and 6 CDs, see Figure 2-4) were obtained for Component 43ZCD. Additional CDs were subsequently collected, so this set is referred to as “Round 1” CDs. The ZIP disks and CDs are listed below with the names for each.

ZIP Disk Z1	PD Study
ZIP Disk Z2	Work in Progress
ZIP Disk Z3	ZIP 100
ZIP Disk Z4	Carol
Round 1 CD1	(No Name)
Round 1 CD2	Documents 1/3/04
Round 1 CD3	Documents – Part 12 of 15
Round 1 CD4	SEM Data
Round 1 CD5	My Disk
Round 1 CD6	My Disk

The ZIP disks and CDs were grouped into one folder when first collected^{38,39}. For purposes of development of the timeline for the files, they have been allocated by the source ZIP disk or CD⁴⁰. The ZIP disks and CDs were important sources for progress reports as noted in Section 2.2⁴¹. The folders in each source are delineated in the timeline table in Appendix E3. The ZIP disks and CDs have been placed in the Project storage tubs.

³⁸ “Inventory of Files Received from ZIP and CD Disks”. Memo to Edmund Storms from Tom Grimshaw, November 19, 2015.

³⁹ “Detailed Inventory of Files Received from ZIP and CD Disks”. Memo to Edmund Storms from Tom Grimshaw, March 27, 2016.

⁴⁰ “Location of ZC Folders and Files in Source Media: ZIP Disks and CDs”. Memo to Edmund Storms from Tom Grimshaw, October 25, 2016.

⁴¹ “Progress Reports and Related Materials in Files Received from ZIP Disks and CDs”. Memo to Edmund Storms from Tom Grimshaw, March 31, 2016.

A. ZIP Disks



B. CDs



*Figure 2-4.
Legacy Media Containing ZC Electronic Data Files*

2.4.4 CDs (Round 2), DVDs, and VHS Tapes

The LENR-related CDs (collected in Round 2), DVDs, and VHS tapes in the 42CVD Component are in eight sets as shown below with the categories of the media^{42,43}:

- CV1 Storms Generated LENR Research Files (18 CDs)
- CV2 Storms 2007 Book, Cold Fusion References, Etc. (29 CDs)
- CV3 ICCF Conferences, Cold Fusion Movies, Etc. (18 CDs)
- CV4 Miscellaneous Cold Fusion Related Topics (4 CDs)
- CV5 Application Software Discs (6 CDs)
- CV6 DVDs from LENR Library (13 DVDs)
- CV7 CDs Containing SEM Images (3 CDs)
- CV8 VHS Tapes (6)

Photos of sets CV1 to CV5 and five of the VHS tapes are shown in Figure 2-5. The contents of each of the eight sets are listed in the timeline table in Appendix E4. The eight sets of items have been placed in the Project storage tubs.

2.4.5 External Hard Drive

Files have been added to the Project from a LaCie 8900 external hard drive⁴⁴ (Component 5EHD, Figure 2-6). The folders on the hard drive are listed below.

Addresses	manuals
Archive ARTICLES	MILEY DATA
Archive, GENERAL	Pd STUDY
CAROL (Selected)	PERSONAL BIO
Case Study	Photo ion detector
CURRENT ARTICLES	PICTURES
Ed's stuff	Pt 2004
Ed's Website	Pt Dot 3
EndNote	Pt Dot 4
High Temp Data set	Pt-Pd(10-16-05)
ICCF-11	Recent data

⁴² "Inventory of CDs and DVDs Added During Onsite Visit #8 and from Storms' LENR Library". Memo to Edmund Storms from Tom Grimshaw, October 23, 2016.

⁴³ "Tabulation of the Contents of CDs, DVDs and VHS Tapes in Project Component CVD". Memo to Edmund Storms from Tom Grimshaw, April 11, 2017.

⁴⁴ "Folders and Files Stored on LaCie 8900 External Hard Drive: Preliminary Inventory". Memo to Edmund Storms from Tom Grimshaw, October 28, 2016.

CDs, Sets CV1 to CV5 (Round 2 CDs)



VHS Tapes, Set CV8. Tape CV8-6 was added after the photo was taken.



*Figure 2-5.
Photo of CDs and VHS Tapes in CVD Subcomponent*

Important Papers
Ken Wolf Commodities
LENR CD Partial
LENR site
Lenr-canr

RGA application
Seebeck converter#1
SEM scans of Case samples
WORK IN PROGRESS

Additional detail on the hard drive files is provided in the timeline, which is in Appendix E5.

The external hard drive has been placed in the Project storage tubs.



*Figure 2-6
LaCie 8900 External Hard Drive. Scale indicated by thumb drive.*

2.4.6 Floppy Disks

Another subcomponent of electronic files consists of two sets of 3 1/2-inch floppy disks, one from a carousel designed for discs of this size and the other from various locations in Dr. Storms' office⁴⁵ (Project Component 46FLD, see Figure 2-7). The timeline for this Component is in Appendix E6. The floppy disks have been placed in the Project storage tubs.

⁴⁵ “Inventory of 3.5-Inch Floppy Disks Added to Project During Onsite Visit #8 (August 2016)”. Memo to Edmund Storms from Tom Grimshaw, October 22, 2016.



*Figure 2-7
Carousel for 3-1/2-Inch Floppy Disks*

The external labels and contents of the disks from the carousel are as follows.

FLD1	1d to now	Pd #1d to now
FLD 2	Calibration	Calibration Test #1-22
FLD3	calorimeter	Calorimeter drawings, calorimeter graphs
FLD4	calorimeter data	excell, calibration, Pt Test #1-19 + Summary
FLD5	CF data	cold fusion data folder, 1991 Tritium Production
FLD6	CF text archives	Cold Fusion Text archives, 10
FLD7	Cold Fusion	1989 - 1993
	Letters	
FLD8	Cold fusion talk	Cold Fusion talk
FLD9	J#4	2/29 – 9/5
FLD10	J#4-2	J#4, 3/29 – graphs & summary
FLD11	Papers	Effect of Hydriding – Paper & data, Electrolytic Tritium – Paper & data
FLD12	papers2	28 th Intersociety CANR-Paper, ICCF-4, Minsk conf., Review-1991, Electrolytic heat
FLD13	Pd #24-12c	Excell data, Pd #24 to 12c, Excess volume
FLD14	Pd charging #1-10	Excell data, Pd charging Pd #1 - #10
FLD15	Progress	Cold Fusion, Progress & memos & proposal
FLD16	Star C	Star C*Cold Fusion Text Archives
FLD17	Talks	Various CF Talks
FLD18	tritium study	Tritium Data

The labels and contents of the disks from Dr. Storms' office are shown below.

FLD19	Cold Fusion	Cold Fusion, archives data
FLD20	backup	Physical Study, Data Index 1990
FLD21	Hypervard	Backup
FLD22	Letters	Cold Fusion Letters, 1984-patterson data
FLD23	21 Century	Cold Fusion, An Outcast of Science, E. Storms 9/97, 97401 DC_001, Mac disc, FullWrite, Text only, MacWrite 5.0. II
FLD24	LABS PROPOSAL	→Ed Storms, from Steve Jones PROPOSAL, LABS
FLD25	storms	What ever happened to Cold Fusion? Edmund Storms, Mac disc, 98463 MMH001
FLD26	(Not readable)	How to produce P-F effect, FP Award, When to listen, ICCF-4 photocopy

A portion of the floppy disk files was printed, and PDF copies of the prints have been included in the Project storage device⁴⁶.

2.5 Hard Copy Records

Hard copy records have been incorporated in the Project from two sources – Dr. Storms' office and a storage area below his home. The records (Component 50HCR) were obtained in two Rounds. The Round 1 records have been placed in eight storage tubs with hanging folders and are kept in a small room in the lower floor of Dr. Storms' home (Figure 2-8a). The records collected in Round 2 are in six storage tubs that are located in a room below the breezeway between the two parts of the home (Figure 2-8b). Round 1 has been described in a series of memos in 2015⁴⁷ and 2016^{48,49,50,51}. Round 2 is described in memos prepared in 2017^{52,53}.

⁴⁶ "Printed Floppy Disk Files of Project Component 46FLD". Memo to Edmund Storms from Tom Grimshaw, June 21, 2017.

⁴⁷ "Index for Hard-Copy Files". Memo to Edmund Storms from Tom Grimshaw, September 6, 2015.

⁴⁸ "Scanning of Hard-Copy Files: Stage 1". Memo to Edmund Storms from Tom Grimshaw, January 9, 2016.

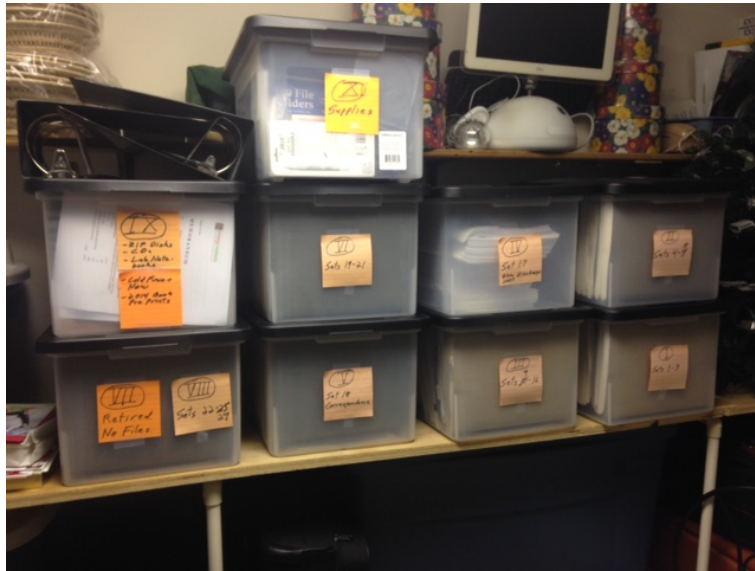
⁴⁹ "Stage 1 Report for Hard Copy Files Stored in Tubs". Memo to Edmund Storms from Tom Grimshaw, January 19, 2016.

⁵⁰ "Hard Copy Files: Assignment of Dates and File Reorganization". Memo to Edmund Storms from Tom Grimshaw, October 19, 2016.

⁵¹ "Additional File Boxes for Hard Copy Files (Project Component HCF)". Memo to Edmund Storms from Tom Grimshaw, April 1, 2016.

⁵² "Completion of Stage 1 Processing Hard Copy Files Stored in Tubs". Memo to Edmund Storms from Tom Grimshaw, April 21, 2017.

⁵³ "Additional File Boxes for Hard Copy Files (Project Component HCF): Update". Memo to Edmund Storms from Tom Grimshaw, June 8, 2017.



a. Storage Tubs with Round 1 Hardcopy Records. Located in Small Storage Room.



b. Storage Tubs with Round 2 Hardcopy Records. Photo Taken in Breezeway.

*Figure 2-8
Photos of Storage Tubs with Hardcopy Records*

The Round 1 hard copy records have been organized into 32 Sets, which are listed below with the sources of the records and the tub containing each Set.

<u>Tub</u>	<u>Set</u>	<u>Source</u>
I	1 – 3	Basement
II	4 – 8	Basement
III	9 – 16	Basement
IV	17	Basement
V	18	Storms' Office
VI	19 – 21	Storms' Office
VII	None	Retired; Files Moved to Other Sets
VIII	22 – 32	Files Added or Reorganized

The Sets have been reviewed with Dr. Storms to provide context^{54,55,56}. An inventory of the files has been completed, and dates have been assigned as shown in Appendix F1⁵⁷.

The six storage tubs containing the Round 2 records are summarized below with a general description of the contents. A timeline has not yet been prepared for the Round 2 hard-copy records.

<u>Tub</u>	<u>Description</u>	<u>Contents</u>
A	"Receipts for Energy K Systems".	35 Manila Envelopes.
B	"First Drawer in Guestroom... Cabinet".	Small white three ring binder. Large black three-ring binder: "Publications (Cold Fusion)" by Ed Storms.
C	Loose CF Papers	Cold fusion papers by Storms. 60 items.
D	From Box 3.	Two large blue and two large black 3-ring binders. "Fusion Facts", etc.
E	3-Ring Binders	8 White and 2 Dark Blue 3-Ring Binders
F	Three 3½-Inch White Ring Binders	Lattice Energy Progress Reports, etc.

A principal objective of the Project is to make the research records as accessible as possible. An effort has therefore been initiated to scan as many of the hard copy files into electronic (PDF)

⁵⁴ "Index for Hard-Copy Files". Memo to Edmund Storms from Tom Grimshaw, September 6, 2015.

⁵⁵ "Stage 1 Report for Hard Copy Files Stored in Tubs". Memo to Edmund Storms from Tom Grimshaw, February 19, 2016.

⁵⁶ "Completion of Stage 1 Processing Hard Copy Files Stored in Tubs". Memo to Edmund Storms from Tom Grimshaw, April 21, 2016.

⁵⁷ "Hard Copy Files: Assignment of Dates and File Reorganization". Memo to Edmund Storms from Tom Grimshaw, October 19, 2016.

form as possible⁵⁸. Because of the large volume of the files, they are being scanned on a prioritized basis. The PDF files have been copied into the Project storage device. A detailed tabulation of the hard copy files is shown in Appendices F2 and F3, with the scanned portions shown in italics⁵⁹.

2.6 Research Laboratory

Dr. Storms has developed a sophisticated operation for LENR experiments in the annex to his home laboratory in Santa Fe. He has conducted experiments using almost all methods for achieving the LENR effect, including the electrolytic, gas loading, gas discharge, and other methods^{60,61,62}. The lab (Component 60RSH) consists of a flexible apparatus for preparing samples and performing experiments as well as a sophisticated scanning electron microscope (SEM). Examples of electrolytic cells and calorimeters are shown in Figure 2-9. A typical experiment setup, in this case using the gas loading method, is shown in Figures 2-10. The SEM, which has energy-dispersive X-ray (EDX) spectroscopy capability for determining the elemental composition of the surface, is shown in Figure 2-11.

The lab operation began in about June 1995, when it was set up in the lower floor of the main part of Dr. Storms' home. It was subsequently moved to its current location in the lower floor of the annex to the home. An exterior photo of Dr. Storms' home laboratory is in Figure 2-12. A timeline has not been prepared for the Research Laboratory Component.

⁵⁸ "Scanning of Hard-Copy Files: Stage 1". Memo to Edmund Storms from Tom Grimshaw, January 9, 2016.

⁵⁹ "Trial Transcription of Interview Session #1 by Online Service, Rev.com". Memo to Edmund Storms from Tom Grimshaw, April 7, 2016

⁶⁰ "Description of LENR Laboratory Facilities, Santa Fe, NM as of January 2015". Memo to Edmund Storms from Tom Grimshaw, December 9, 2015.

⁶¹ "Electrolytic Cells and Calorimeters Used in LENR Research". Memo to Edmund Storm from Tom Grimshaw, September 26, 2016.

⁶² "Photographs of LENR Research Activities: Conferences and Meetings, Laboratories, and Electrolytic (and Related) Cells". Memo to Edmund Storms from Tom Grimshaw, December 20, 2016.



Figure 2-9.

Electrolytic Cells and Calorimeters.

Examples have different objectives, design and operation. Thumb drive is 2.75 in long.

Upper Electrolytic Cell: Designed to explore the location of active sites in the sample.

Second Item from Top: Jacket for isoperibolic calorimeter.

Three Cells in Lower Part of the Photo: Typical electrolytic cells used for LENR studies.

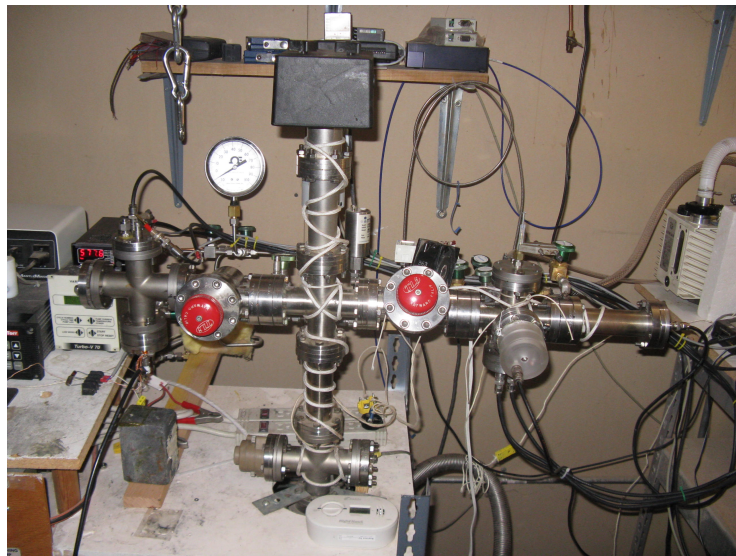


Figure 2-10. Gas Loading Setup.

Experiment is on the right arm and sample preparation is on the left arm.

A mass spectrometer is on the upper arm.



Figure 2-11.

*Scanning Electron Microscope (SEM) with Energy-Dispersive X-Ray (EDX) Spectroscopy Capability.
The SEM is the tall vertical cylinder. The EDX is the instrument just to the left of the SEM.*



Figure 2-12.

*Exterior View of Dr. Storms' Home Laboratory near Santa Fe, NM.
The lab is on the lower floor of the annex to the home. Photo taken April 2016.*

2.7 *LENR Library*

During his long research career, Dr. Storms accumulated one of the best libraries of LENR publications, books, and related materials in the world. The library (Component 70LLB) is located in Dr. Storms' office. It consists of electronic files (5000 LENR papers and similar items), hard-copy papers (at least 1700 papers, some of which are also in the electronic file collection), and over 120 books and similar items^{63,64}. The bookshelves containing the hard-copy papers and books are shown in Figure 2-13. The electronic files are maintained in Endnote® by Dr. Storms. Copies have been incorporated in the Project storage device. Dr. Storms' publication collection also formed the "kernel" of an online library, LENR-CANR.org, which was started in about 2002 by Jed Rothwell and Dr. Storms⁶⁵.

The hard-copy papers are on the bookshelves (about 30 feet of shelf space) in Dr. Storms' office in Santa Fe. The books, which are on four bookshelves adjacent to the hard-copy papers, include conference proceedings (particularly for ICCF conferences), books on LENR, journals (Infinite Energy, 21st Century Science & Technology, Journal of Fusion Technology), and other paper copies of LENR materials. Particularly noteworthy in this collection is an almost complete set of materials obtained by Dr. Storms during his attendance at ICCF conferences. This is one of the most complete collections of these conference materials available, as they are not routinely collected and stored by mainstream libraries. Dr. Storms' library also contains a complete collection of 125 Infinite Energy magazines. The bookshelf holdings are listed with year and date in Appendix H.

⁶³ "Stage 1 Summary: LENR Library Holdings". Memo to Edmund Storms from Tom Grimshaw, February 22, 2016.

⁶⁴ "Inventory of Bookshelf Materials in Storms' Office". Memo to Edmund Storms from Tom Grimshaw, April 17, 2016.

⁶⁵ Rothwell, J., and E. Storms, 2003. The LENR-CANR Website, Its Past and Future. Proceedings of ICCF-10, p. 939-942. August.



Figure 2-13.

Dr. Storms with Hard-Copy Publications of the LENR Library.

Photo taken October 2015. The bookshelves in the center of the photo contain individual LENR papers. On the right, bookshelves contain books, journals, and conference proceedings.

2.8 Other Sources: Conferences and 2007 Book

Dr. Storms attended all but four of the International Conferences on Cold Fusion (ICCFs) from 1990 to 2015⁶⁶, which are shown below.

<u>ICCF#</u>	<u>Year</u>	<u>Location</u>
1	1990	Salt Lake City, Utah
2	1991	Como, Italy (Storms did not attend)
3	1992	Nagoya, Japan
4	1993	Lahaina, Hawaii
5	1995	Monte Carlo, Monaco
6	1996	Hokkaido, Japan
7	1998	Vancouver, British Columbia
8	2000	Lerici, Italy
9	2002	Beijing, China (Storms did not attend)
10	2003	Cambridge, Massachusetts
11	2004	Marseilles, France
12	2005	Yokohama, Japan

⁶⁶ “Photographs of LENR Research Activities: Conferences and Meetings, Laboratories, and Electrolytic Cells!”. Memo to Edmund Storms from Tom Grimshaw, December 20, 2016.

13	2007	Dagomys, Sochi, Russia
14	2008	Washington, DC
15	2000	Rome, Italy
16	2011	Chennai, India
17	2012	Daejeon, South Korea (Storms did not attend)
18	2013	Columbia, Missouri
19	2015	Padua, Italy (Storms did not attend)

Dr. Storms gave presentations and prepared papers at most of the conferences, and he collected the abstracts, proceedings, and related materials and has placed them in his LENR Library as noted above.

A timeline has been prepared for the ICCF conferences and is provided in Appendix G-1. Dr. Storms received the Preparata Medal, the highest award in the LENR field, in 2005 at ICCF-12, when the conference was held in Yokohama, Japan. A picture taken of Dr. Storms with Charles Beaudette during that conference⁶⁷ appears in Figure 2-14. Photos taken at ICCF-10 (with Michael Melich) at Cambridge, Massachusetts in 2003⁶⁸, at ICCF-12 (with Tom Passel) in 2005 at Yokohama, Japan, and at ICCF-14 (with Cantwell and Matt McConnell) in 2008 at Washington, D.C.⁶⁹ are shown in Figures 2-14, 2-15, 2-16, and 2-17.

Dr. Storms has provided papers and made presentations at a number of other conferences as well (shown below).

- American Physical Society (2003)
- American Chemical Society (1999)
- Institute of Electrical and Electronic Engineers (IEEE) (1995)
- Electric Power Research Institute (EPRI) (1994)
- U.S. Naval Research Laboratory (2001)
- Japan Cold Fusion Research Society (2002)
- Academy for New Energy (1997)
- Integrity Research Institute (1999)

⁶⁷ McKubre, M., 2015. A Brief History and Introduction to the International Conference Series, Part 2, ICCF-4 to ICCF-6. "History" on ICCF-19 website. Online. Available: <http://www.iccf19.com/history.html>.

⁶⁸ McKubre, M., 2015. A Brief History and Introduction to the International Conference Series, Part 4, ICCF-10 to ICCF-12. "History" on ICCF-19 website. Online. Available: <http://www.iccf19.com/history.html>.

⁶⁹ McKubre, M., 2015. A Brief History and Introduction to the International Conference Series, Part 5, From ICCF-13 to ICCF-15. "History" on ICCF-19 website. Online. Available: <http://www.iccf19.com/history.html>.



*Figure 2-14.
Dr. Storms with Charles Beaudette at ICCF-5, Monte Carlo, 1995. Photo Courtesy of
Gene Mallove.*



*Figure 2-15.
Dr. Storms with Michael Melich at ICCF-10, Cambridge, MA, 2003. Photo Courtesy
of Gene Mallove.*



Figure 2-16.

*Dr. Storms with Tom Passell, Enjoying Taiko Drums at ICCF-12, Yokohama, Japan, 2005.
Photo Courtesy: David Nagel.*



Figure 2-17.

*Dr. Storms with Rick Cantwell (left) and Matt McConnell at ICCF-14, Washington, DC, 2008.
Photo Courtesy: Duy Tran.*

Dr. Storms provided a thorough description of his LENR research in his first book, particularly in Chapter 2, that covers his earliest work at LANL up to 2007, the date the book was published. The contents of the book have been reviewed for additional background and content for the Project. A timeline for this Component is provided in Appendix G-2.

2.9 Integrated Timeline

The timelines developed for each of the Components have been combined into in Integrated Timeline⁷⁰ and sorted in the same order as the individual timelines – first by year, then by month, and then by Component. The Integrated Timeline (excluding Work History) is shown in Appendix I-1. The Work History timeline is in Appendix I-2. It was prepared separately from the other Components because of the importance of the experiment descriptions to the Project and because it has many more entries in the spreadsheet than all other Components combined. Because of this breakdown into two parts, Appendix I-2 is equivalent to Appendix D. The Integrated Timeline has been analyzed for delineating Dr. Storms' LENR research career phases in Section 4.

2.10 Interviews of Dr. Storms

Three rounds of interviews of Dr. Storms that cover his LENR research over the past 28 years have been accomplished for the Project^{71,72,73,74,75,76}. They cover the period from his earliest research at Los Alamos National Laboratory to the end of 2015. A total of more than 22 hours of

⁷⁰ “Integrated LENR Research Timeline: Test Case”. Memo to Edmund Storms from Tom Grimshaw, July 27, 2016.

⁷¹ “Detailed Interview Sessions During Onsite Visit #9”. Memo to Edmund Storms from Tom Grimshaw, April 6, 2016.

⁷² “Trial Transcription of Interview Session #1 by Online Service, Rev.com”. Memo to Edmund Storms from Tom Grimshaw, April 7, 2016.

⁷³ “LENR Work History (Lab Notebooks): Status Update with Photo and Audio Recordings “. Memo to Edmund Storms from Tom Grimshaw, April 20, 2016.

⁷⁴ “Transcriptions of Interviews for the Phase 3 Report of the Storms LENR Research Documentation Project”. Memo to Edmund Storms from Tom Grimshaw, June 13, 2016.

⁷⁵ “Transcriptions of March, 2016 (Round 1) Interviews”. Memo to Edmund Storms from Tom Grimshaw, July 9, 2016.

⁷⁶ “Annotated Transcriptions of Three Rounds of Interviews (Rounds 1, 2, and 3)”. Memos to Edmund Storms from Tom Grimshaw, August 22, 2016.

interviews were held. The dates and number of sessions in each of the 34 interviews are summarized as shown below.

<u>Round</u>	<u>Approximate Date</u>	<u>Sessions</u>
1	April 2016	8
2	March 2017	11
3	June 2017	15

The interviews were recorded using an iPhone app, SmartRecord. The recorded interviews were submitted to the online service Rev.com for transcription. The printed transcripts were then reviewed and marked up for spelling errors, correction of names, filling in missing information, and addition of annotations. The text was highlighted to emphasize important points. This marked up copy of the transcripts is in Annex III. Timelines have not been prepared for the interviews.

Preliminary interviews have also been held with Tom Claytor and Malcolm Fowler, both LANL retirees, for possible future documentation of LENR investigations⁷⁷. These interviews have not yet been included in the Storms Project.

⁷⁷ “April 2016 Interviews: Transcripts (Claytor and Fowler)”. Memo to Tom Claytor and Malcolm Fowler, April 10, 2016.

3 *Pre-LENR Career at Los Alamos National Laboratory*

Dr. Storms had enjoyed a 35-year career, primarily in advanced materials research, when LENR was announced in 1989, which enabled him to quickly become established as a premier investigator in the field⁷⁸. His pre-LENR research was primarily in refractory materials such as the carbides and nitrides for high-temperature applications. One of his major publications during this period was a book on the refractory carbides⁷⁹ (Figure 3-1). He also authored or contributed to many LANL reports, which are listed Table 3-1.

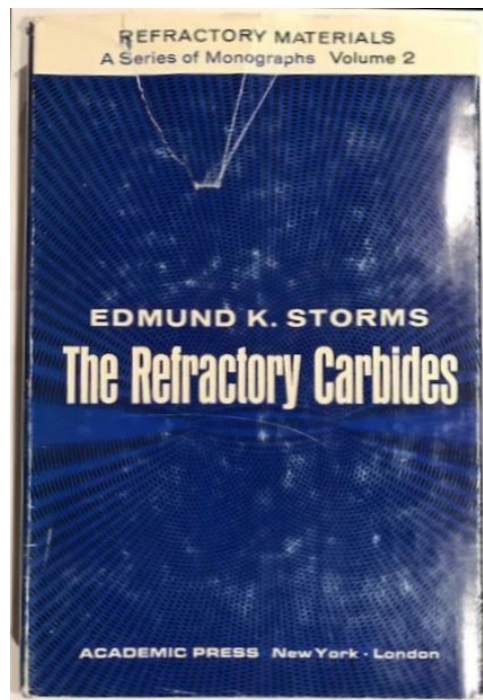


Figure 3-1.
Dr. Storms 1967 Book on Refractory Carbides.

⁷⁸ "Research at Los Alamos National Laboratory Prior to LENR Involvement". Memo to Edmund Storms from Tom Grimshaw, December 17, 2016.

⁷⁹ Storms, E., 1967. The Refractory Carbides. New York. Academic Press.

1		Enhanced-wetting, boron-based liquid-metal ion source and method.	Bozack, Michael J.	US PATENT 5,871,848	1999
2	MFICHE: LA-12043-MS REPT: LA-12043-MS	Behavior of ZrC (sub 1-x) and U(sub y)Zr(sub 1-y)C(sub 1-x) in flowing hydrogen at very high tem	Storms, Edmund Kugler,	LA-12043-MS	1992
3		Liquid metal ion source and alloy.	Clark, William M., Jr.	US PATENT 4,775,818	1988
4		Liquid metal ion source and alloy for ion emission of multiple ionic species.	Clark, William M., Jr.	US PATENT 4,670,685	1987
5	MAIN: QD172.A3 C45 pt.6	The actinide carbides /	Holley, C. E.		1984
6	MFICHE: LA-9524 REPT: LA-9524	An analytical representation of the thermal conductivity and electrical resistivity of UC _{1±x} ,	Storms, Edmund Kugler,	LA-9524	1982
7	MFICHE: LA-DC-9724	Uranium--carbon and plutonium--carbon systems.	Storms, Edmund Kugler, 1931-	LA-DC-9724	1968
8	MAIN: TA418.26 R43x v.2	The refractory carbides /	Storms, Edmund Kugler,		1967
9	MFICHE: LA-3331 REPT: LA-3331	Heat capacities of NbC[sub 0.702], NbC[sub 0.825], NbC[sub 0.980] and Nb[sub 2]C below 320[degre	Sandenaw, Thomas A.	LA-3331	1965
10	MFICHE: LA-2942 REPT: LAMS-2942	A critical review of refractories.	Storms, Edmund Kugler, 1931-	LA-2942	1964
11	REPT: LAMS-2674	Critical review of refractories. Part 1. Selected properties of group 4a, -5a, and -6a carbides	Storms, Edmund Kugler, 1931-	LAMS-2674- Pt. 1	1962
12	REPT: LAMS-2674-pt.2	Critical review of refractories. Part 2, Selected properties of group 4a, -5a, and -6a nitrides	Storms, Edmund Kugler, 1931-	LAMS-2674- pt.2	1962
13	REPT: LADC-4478	Lattice dimensions of NbC as a function of stoichiometry.	Kempton, C. P. (Charles P.)	LADC-4478	1960
14	REPT: LA-DC-4356	Properties of lithium hydride. I, Single crystals	Pretzel, F. E. (Frank E.)	LA-DC-4356	1960
15	REPT: LADC-3755	The variation of lattice parameter with carbon content of niobium carbide.	Storms, Edmund Kugler, 1931-	LADC-3755	1959

*Table 3-1.
Pre-LENR Publications That Ed Storms Authored (or Contributed to) as
Listed on LANL Library Website*

Dr. Storms' work was primarily in support of two large programs for a nuclear rocket (Rover) and for nuclear reactors as power sources for satellites (SP-100). The objective of the Rover program was to develop a nuclear thermal rocket. It continued at LANL from 1955 to 1972 and had three phases – Kiwi, Phoebus, and Peewee (Figure 3-2). It involved NASA and the Atomic Energy Commission and was managed by the Space Nuclear Propulsion Office of the Executive Office.



*Figure 3-2.
Nuclear Rocket Test Equipment from LANL's Rover Program.
The equipment from the first phase (Kiwi) is on the left. Equipment from the second phase (Phoebus) is on the right.*

The SP-100 (for Space Power 100 kWe) program objectives were to develop nuclear reactors as power source is primarily for spy satellites during the Cold War (Figure 3-3). The program originated in the 1980s as a space-based power supply for Star Wars weapons. Later it evolved into a flexible design capable of space-based, lunar-based, and Mars-based power applications. It continued until the early 1990s.

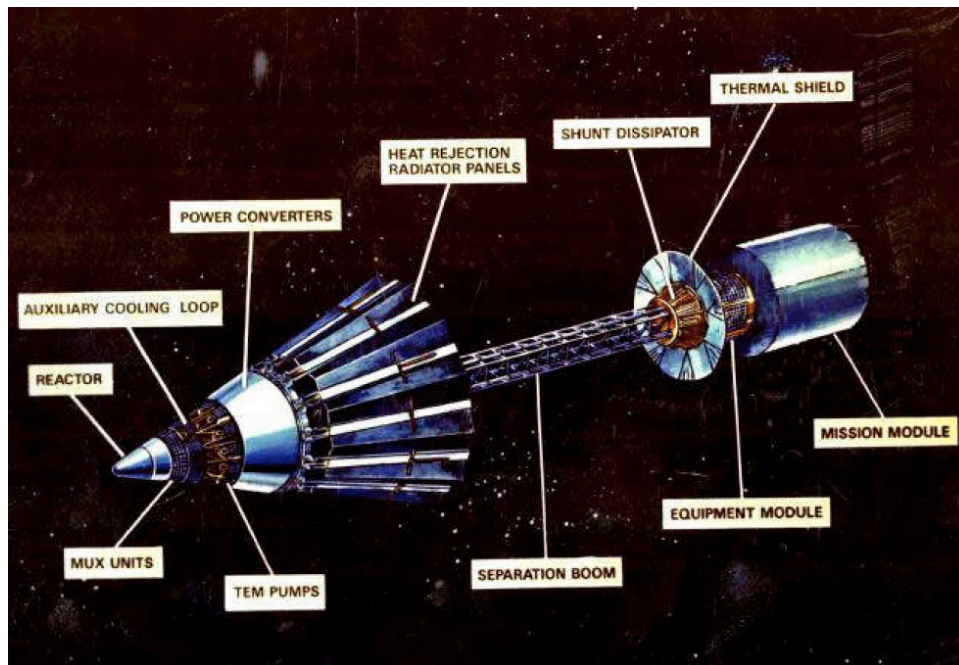


Figure 3-3.

Schematic of SP-100 Space Reactor with Generic Deployment Boom

Dr. Storms' advanced research in refractory materials is evident in both programs. The Rover design, for example, utilized nuclear reactors that he had solid cores. The high temperatures of operation (over 4300°F) of the solid core reactors required the use of materials with very high melting points. The refractory materials were used to protect reactors from corrosion caused by very high temperature hydrogen that was used for propulsion. Dr. Storms has a large collection of hard-copy and electronic files from his pre-LENR work at LANL⁸⁰. Similar hard-copy files have also been obtained from Tom Claytor⁸¹. Neither of these collections has been incorporated in the Storms LENR Documentation Project.

Dr. Storms' pre-LENR career as a nuclear chemist doing advanced materials research at LANL has made him particularly well qualified to conduct LENR experiments and develop advanced explanations. He has in-depth of knowledge of the nucleus and the electron shell of atoms, both of which are involved in the LENR mechanism.

⁸⁰ "File Boxes for Pre-LENR Research at Los Alamos National Laboratory". Memo to Edmund Storms from Tom Grimshaw, March 24, 2017.

⁸¹ "Inventory of Claytor Materials Related to Early Cold Fusion Research at Los Alamos National Laboratory". Memo to Tom Claytor from Tom Grimshaw, March 13, 2017.

4 *LENR Research Phases*

As noted in Section 2, the timelines for most of the Project Components were combined into an Integrated Timeline (Appendix I), which was then re-sorted into ascending order (by month and year). The information in the Components shown in this way provides the basis for delineating the Phases of Dr. Storms' LENR research since 1989. These phases are shown below with the approximate beginning and end dates for each phase.

<u>Phase</u>	<u>Description</u>	<u>Dates</u>
1	LENR Work at Los Alamos National Laboratory	3/1989 – 8/1991
2	Independent Investigation 1	9/1991 – 12/1993
3	ENECO	1/1994 – 2/1998
4	Independent Investigation 2	3/1998 – 6/2000
5	Lattice Energy	7/2000 – 2/2006
6	Independent Investigation 3	3/2006 – 1/2007
7	Kiva Labs	2/2007 – 2/2012
8	Independent Investigation 4	3/2012 – 12/2015

The Phases are determined primarily by the entity Dr. Storms was working with or from whom he was receiving financial support. These periods are separated by times when he was working independently on his LENR research.

An overall description is provided in this Section for each Phase, including the type of experimental work undertaken and the sponsor with whom Dr. Storms was working. The Publications and Unpublished Progress Reports are listed for the years of the Phase, followed by a review of the research record as contained in the Work History, Electronic Files, Hard-Copy Records, and other Components. The Interviews Component has not yet been included as a source for the description of the Phases. Most of the characterization of the research record is based on review of the year-by-year summary of the events and files in the Stage 2 Report (Second Draft, June 3, 2017, as noted in Section 1).

4.1 Phase 1. Los Alamos National Lab (3/1989 – 8/1991)

As he was working on the SP-100 Program at LANL, Dr. Storms took an immediate interest in LENR when he heard about its announcement in March 1989. He began experiments and development of explanations within a few weeks and continued to research the phenomenon for the next 2½ years until he retired from LANL in August 1991. The initial stage of his experiments utilized tritium as the signature of LENR, and heat energy as measured in a calorimeter was used in the second stage. He achieved success in initiating and measuring LENR

in both stages.

LANL Response to LENR Announcement

A compact source of high-density energy like LENR would help LANL to accomplish its mission, particularly for energy for space applications as noted for the SP-100 program. An initial meeting of several organizations in the Lab took place on March 27, a mere four days after the announcement. No fewer than eight teams emerged to achieve LENR using different methods and signatures. Initial funding from the DOE of \$350,000 was shared among the various teams. Stanley Pons was invited to give a presentation in April 1989, and Martin Fleischmann made a visit in February 1990.

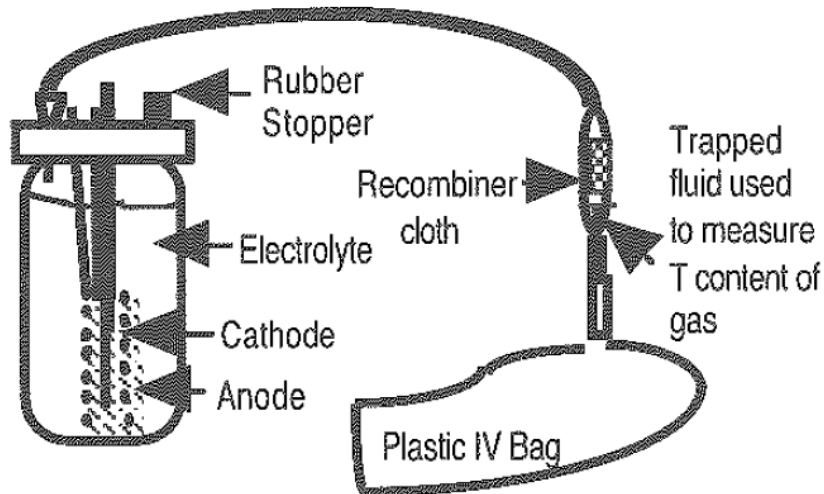
Many consolidated progress reports covering activities and results of the various LANL research teams were issued from March 1989 until research was discontinued. A meeting was convened in Santa Fe by LANL and DOE on May 23 to 25, 1989 in which investigators in the national laboratories around the country described their methods and results. In the end, just two teams, headed by Ed Storms and Tom Claytor, had success in achieving LENR using different methods but with tritium as the signature. It is interesting that Drs. Storms and Claytor are the researchers who continued to pursue the phenomenon in their private laboratories after retiring from LANL.

Experiments with Tritium as the Signature

Dr. Storms' initial LENR experiments at LANL utilized electrolytic cells with palladium and deuterium similar in concept to the devices used by Fleischmann and Pons. Tritium was used as the signature because its presence clearly demonstrates nuclear reactions and because of a high level of expertise and long history of tritium research at LANL. Furthermore, tritium had been reported by Fleischmann and Pons. Carol Talcott, whose expertise was on hydrogen storage in palladium for highly confidential applications for nuclear devices, worked closely with Dr. Storms. Carol and Ed were subsequently married.

As described in his 2007 book (Chapter 2), more than 250 electrolytic cells were investigated using deuterium oxide (heavy water) and palladium from many sources. The experimental setup is shown in Figure 4-1. Tritium was measured in the electrolyte and in the gas evolved, which was captured in IV bags (normally used to administer fluids intravenously). Thirteen of the cells

were found to produce tritium from LENR. The study included extensive measurements to eliminate possible non-LENR sources of the absurd tritium. Dr. Storms and Carol Talcott presented the results of their tritium research at the first annual conference on cold fusion⁸².



*Figure 4-1.
Experimental Setup for Electrolytic Cels. (From Storms, 2007, Figure 3.)*

Experiments with Excess Heat as the Signature

In the second phase of his LENR experiments at LANL, Dr. Storms again used electrolytic cells with palladium and deuterium, but with excess heat rather than tritium as the signature. The calorimeter for measuring heat contained the experimental cells. A drawing and photo are shown in Figure 4-2. The most significant palladium samples used were from Dr. Akito Takahashi in Japan. Three samples from Tanaka Kikinzoku Metals were run. The first produced considerable excess heat, The second generated none, and the third also produced heat, but in a lesser amount than the first.

⁸² Storms, E.K. and C.L. Talcott. A study of electrolytic tritium production. in *The First Annual Conference on Cold Fusion*. 1990. University of Utah Research Park, Salt Lake City, Utah: National Cold Fusion Institute. p. 149.

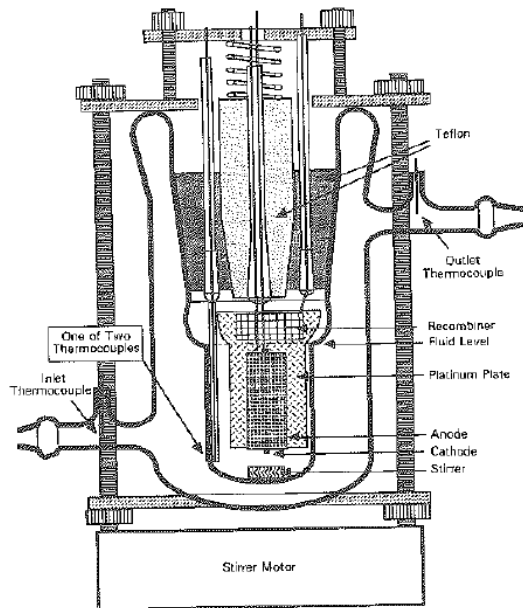


Figure 4-2.

Diagram and Photo of Calorimeter and Electrolytic Cell Utilized in LANL Excess Heat Experiments.

(Diagram from Storms, 2007, Figure 8. Photo Taken at Dr. Storms Home Lab, April 2016.)

Discontinuation of LENR Research at LANL

The controversy surrounding LENR was well underway within a month or so or two after the March 1989 announcement. The Secretary of Energy directed DOE's Energy Research Advisory Board (ERAB) to conduct an investigation and make recommendations. LANL submitted its report to ERAB on September 11, 1989⁸³. The draft ERAB report was issued in July and the final report in November 1989. Although the content of the report appeared not to be completely negative, the effect was the same as if it were. After the final ERAB Report, the DOE directed the national laboratories to discontinue LENR investigations. The LANL correspondence implementing this direction appeared as an undated hand-written note to Bruce Jensen (author

⁸³ "Results of Cold Fusion Research at Los Alamos National Laboratory. Prepared September 11, 1989, for the Cold Fusion Panel, Energy Research Advisory Board to the U. S. Department of Energy". Unpublished Report. Item 1 of Memo to Tom Claytor from Tom Grimshaw, March 13, 2017.

unknown) on an internal LANL memo dated March 1, 1991⁸⁴.

Dr. Storms nevertheless was able to continue his LENR research at a reduced level. After the work on the Takahashi samples, he collected the significant papers in the field and in 1991 he published a summary of what was known in the field at that time⁸⁵. This collection was the foundation for Dr. Storms' LENR Library, undoubtedly the most complete collections of literature in the field. It also led to Dr. Storms' subsequent work with ENECO, which is described in Phase 3. Dr. Storms also had extensive correspondence with other LENR researchers during these earliest years of the field, and he sponsored and organized Martin Fleischmann's visit to LANL in February 1990. As noted above, Dr. Storms attended the first conference dedicated to LENR research, ICCF-1, in Salt Lake City in 1990.

LENR Publications and Reports

Dr. Storms, along with Carol Talcott, prepared a number of reports, presentations and published papers from their LENR work at LANL as shown below.

Talcott, C.L., et al. Tritium measurements: Methods, pitfalls, and result. in EPRI/NSF Workshop. 1989. Washington, DC.

Storms, E. and C. Talcott, Electrolytic charging of palladium with deuterium to high stoichiometry, P. Report, Editor. 1989.

Storms, E. A New method for initiating nuclear reactions. in First International Conference on Future Energy. 1989. Washington, DC: Unpublished.

Storms, E.K., and C. Talcott., Attempts to understand and reproduce cold fusion. Workshop on Cold Fusion Phenomena, Santa Fe. Abstracts. May 1989.

Storms, E., C. Talcott, and M. David., Recent results for electrolytic tritium production at Los Alamos. 1989.

Talcott, C.L. and E. Storms. An overview of "cold fusion". in JOWOG-12 Meeting, Atomic Weapons Estab. 1990. Aldermaston, England.

Storms, E.K. and C.L. Talcott. A study of electrolytic tritium production. in The First Annual Conference on Cold Fusion. 1990. University of Utah Research Park, Salt Lake City, Utah: National Cold Fusion Institute. p. 149.

Storms, E. and C.L. Talcott, Electrolytic tritium production. Fusion Technol., 1990. 17: p. 680.

Storms, E.K., Letter to Science. 1990.

⁸⁴ "Cold Fusion". Memo from Bruce Matthews to Michael Stevenson and Reed Jensen (LANL Staff), March 1, 1991.

⁸⁵ Storms, E., Review of experimental observations about the cold fusion effect. Fusion Technol., 1991. 20: p. 433.

Storms, E., Review of experimental observations about the cold fusion effect. *Fusion Technol.*, 1991. 20: p. 433.

Storms, E.K. and C. Talcott-Storms, The effect of hydriding on the physical structure of palladium and on the release of contained tritium. *Fusion Technol.*, 1991. 20: p. 246.

Research Record

The research record for Phase 1 includes generally the contents of the Project Components for 1989, 1990, and 1991. The lab notebooks were started in 1995, so there is no work history for this period. The electronic folders and files are almost entirely on the floppy disks and include folders named “Cold Fusion Text Archives”, “Progress Reports and Memos and Proposal”, “Physical Study”, and “CF Data” as well as papers by Dr. Storms and Carol Talcott from their LENR research at LANL. Information on the tritium work is also on one of the floppy disks and a ZIP desk.

The hard-copy records are quite extensive and include LANL memos on LENR work by various entities at the Lab as well as other National Laboratories, copies of LENR articles in newspapers and magazines, data from the tritium studies at LANL, chemical analysis reports, micrographs of samples, and correspondence with other LENR researchers. Items of particular interest in the research record are the LANL Lab-wide memos, the LANL report submitted to the ERAB committee, the internal memo stopping LENR work at LANL, correspondence with other prominent researchers, and proceedings from the earliest ICCF conferences.

4.2 Phase 2. Independent Investigation 1 (9/1991 – 12/1993)

Although Dr. Storms and his wife, Carol Talcott Storms, focused on building their new home in Santa Fe after his retirement, he continued to make contributions to the LENR field. This phase of his research extended from his August 1991 retirement to about January 1994, when he began working closely with ENECO.

During this Phase, as he was consulting to LANL after retirement, Dr. Storms was asked to give testimony to the US Congress in 1993⁸⁶, although as an independent citizen rather than representing the Laboratory. He was also requested to visit New Hydrogen Energy (NHE)

⁸⁶ Storms, E.K. Statement of Dr. Edmund Storms before Congress. in Hearing Before the Subcommittee on Energy of the Committee on Science, Space, and Technology, U. S. House of Representatives, One Hundred Third Congress, First Session. 1993. Washington, C.D.: U.S. Government Printing Office. p. 114.

Laboratory in Japan, where he provided guidance on how to achieve LENR. One of the NHE supporters, IMRA, subsequently provided some 90 palladium samples to investigate the effect of lattice expansion on achieving LENR.

Dr. Storms had plans to develop a LENR research lab when he and Carol designed and built their new home. The lab was opened during Phase 2, although the lab notebooks began later, in 1995, when Dr. Storms started lab work for ENECO. Because he had one of the few facilities investigating LENR after the ERAB report and widespread withdrawal of research support, Dr. Storms was asked to investigate samples from many researchers. After completing the IMRA work in his home lab, he subsequently used the palladium samples for other kinds of experiments for many years.

Charles Entenmann periodically provided financial support during Phase 2, which was documented in several letters in the hard-copy records. Also during this phase, Dr. Storms participated in a collaborative effort for a proposal to DOE designed to conform to guidance for LENR research support in the November 1989 ERAB report⁸⁷. DOE did not respond favorably to the proposal even though the collaborators were highly successful scientists with strong credentials. Dr. Storms also attended ICCF Conferences #3 (1992, Nagoya, Japan) and #4 (1993, Lahaina, Maui, Hawaii). He did not attend ICCF-2 in Italy.

Publications and Reports

Publications and reports that Dr. Storms authored during 1992 and 1993 are shown below.

Talcott, C.L., et al., Effects on the palladium deuteride lattice constant upon alloying with lithium, draft, Editor. 1992.

Storms, E. Measurement of excess heat from a Pons-Fleischmann type electrolytic cell. in Third International Conference on Cold Fusion, "Frontiers of Cold Fusion". 1992. Nagoya Japan: Universal Academy Press, Inc., Tokyo, Japan. p. 21.

Storms, E.K., Measurements of excess heat from a Pons-Fleischmann-type electrolytic cell using palladium sheet. *Fusion Technol.*, 1993. 23: p. 230.

Storms, E. Some characteristics of heat production using the "cold fusion" effect. in Fourth International Conference on Cold Fusion. 1993. Lahaina, Maui: Electric Power Research Institute 3412 Hillview Ave., Palo Alto, CA 94304. p. 4.

⁸⁷ Hansen, L.D., et al., Cooperative investigation of anomalous effects in Pd/LiOD electrolytic cells. 1994. A proposal submitted to the Department of Energy.

Storms, E. The status of "cold fusion". in 28th Intersociety Energy Conversion Engineering Conference. 1993. Atlanta, GA., P.

Storms, E.K. Statement of Dr. Edmund Storms before Congress. in Hearing Before the Subcommittee on Energy of the Committee on Science, Space, and Technology, U. S. House of Representatives, One Hundred Third Congress, First Session. 1993. Washington, D.C.: U.S. Government Printing Office. p. 114.

Research Record

The research record for Phase 2 was created generally in 1992 and 1993. As in Phase 1, most of the electronic records are on the floppy disks and include data from experiments with palladium (e.g. Pd#1d, Pd#24) and other samples (e.g. J#4). One of the ZIP disks or CDs contains files from ICCFs 1, 3, 4, 5, 6, and 7. The hard-copy records contain cold fusion papers, correspondence with other LENR researchers, materials related to a proposal by Lagowski and the Congressman Swett Committee, and a copy of the statement by Dr. Storms before the House of Representatives Committee on Science, Space, and Technology in May 1983. The LENR Library has the proceedings for ICCF-3 (1992) and ICCF-4 (1993).

4.3 Phase 3. ENECO (1/1994 – 2/1998)

ENECO was a lab that was formed in Salt Lake City to secure patents on LENR utilizing applications to the US Patent and Trade Office (PTO) that have been made by Drs. Fleischmann and Pons through the University of Utah. At the request of Charles Becker, who provided funding for ENECO, Dr. Storms initially assisted with development of patent application documentation. This work started in about January 1994, when he began to receive compensation from ENECO. He had continued to build his LENR Library after his initial compilation and report on the status of the field while still at LANL. This Library provided the literature resource for the PTO patent documentation for ENECO.

The ENECO lab in Salt Lake City was concurrently performing LENR experiments in support of the patent applications with Yan Kucherov as the Director. Dr. Storms was asked to join the ENECO Board of Directors in 1994. He was requested to begin LENR experiments in his home lab, which was started in Phase 2, to support the ENECO work. His work history (lab notebooks) started in June 1995. He continued his work with ENECO until he resigned from the Board of Directors when he felt his contributions were no longer useful to the company. He received his final compensation in February 1998. Primarily because of the negative PTO stance on LENR,

ENECO's efforts to secure a US patent were not successful. ENECO continued operations, including patent efforts not related to LENR (which were also not successful), and the company filed for bankruptcy after Dr. Storms' departure.

During Phase 3, Dr. Storms attended ICCF Conferences #5 (1995, Monte Carlo, Monaco) and #6 (1996, Hokkaido, Japan). Along with Michael McKubre, he received an award in 1998 from Wired Magazine as one of 25 "Those Who Dare".

Publications and Reports

Dr. Storms prepared (or contributed to) the following publications and other documents during Phase 3.

Storms, E., Chemically-assisted nuclear reactions. *Cold Fusion*, 1994. 1(3): p. 42.

Storms, E. Methods required for the production of excess energy using the electrolysis of palladium in D₂O-based electrolyte. in International Symposium, "Cold Fusion and Advanced Energy Sources". 1994. Belarusian State University, Minsk, Belarus.

Storms, E.K., Some characteristics of heat production using the "cold fusion" effect. *Trans. Fusion Technol.*, 1994. 26(4T): p. 96.

Hansen, L.D., et al., Cooperative investigation of anomalous effects in Pd/LiOD electrolytic cells. 1994, A proposal submitted to the Department of Energy (1994).

Storms, E.K., Walt Polansky DOE Briefing. 1994.

Storms, E., Cold Fusion: From reasons to doubt to reasons to believe. *Infinite Energy*, 1995. 1(1): p. 23.

Storms, E.K., Cold fusion, a challenge to modern science. *J. Sci. Expl.*, 1995. 9: p. 585.

Storms, E. Status of "cold fusion". in 5th International Conference on Cold Fusion. 1995. Monte-Carlo, Monaco. p. 1.

Storms, E. The nature of the energy-active state in Pd-D. in II Workshop on the Loading of Hydrogen/Deuterium in Metals, Characterization of Materials and Related Phenomena. 1995. Asti, Italy. p.

Storms, E.K., The nature of the energy-active state in Pd-D. *Infinite Energy*, 1995 (#5 and #6): p. 77.

Storms, E.K. Reaction of Pd with D. in ASTI. 1995. Asti, Italy.

Storms, E. Some thoughts on the nature of the nuclear-active regions in palladium. in 6th International Conference on Cold Fusion, Progress in New Hydrogen Energy. 1996. Lake Toya, Hokkaido, Japan: New Energy and Industrial Technology Development Organization, Tokyo Institute of Technology, Tokyo, Japan. p. 105.

Storms, E., A review of the cold fusion effect. *J. Sci. Exploration*, 1996. 10(2): p. 185.

Storms, E., How to produce the Pons-Fleischmann effect. *Fusion Technol.*, 1996. 29: p. 261.

Storms, E.K., A study of those properties of palladium that influence excess energy production by the Pons-Fleischmann effect. *Infinite Energy*, 1996. 2(8): p. 50.

Storms, E.K., Some problems with palladium and how to solve them. 1997: NHE Japan.

The following unpublished progress reports also appeared during the Phase 3 timeframe.

<u>Title</u>	<u>File Name</u>
(7/3/1995)	Update of activity, 7/3/95
(8/17/1995)	progress report 8/17/95
INITIAL LOADING VALUES (1/3/1997)	Summary of calorimeter studies

Research Record

The record for Phase 3 was developed in the period 1994 to 1997. As noted, the work history (lab notebook summary) began in June 1995. The initial samples were noted as “A1-B4“ with many sample designations attached (e.g. A1-B4#1, #2, #3, #4, #5). They continued through 1995. A second set of samples was designated “Pd“ followed by number samples (e.g. Pd#1, #11, #36). They began in 1996 and continued into late 1997, when additional samples began with “Pd” followed by a different designation (e.g. Pd-W1.1, Pd-VFTP, Pd-A13.1).

Many of the electronic files are once again on floppy disks for Stage 3. Three disks cover the following folders and topics: 1) cold fusion letters; 2) interviews of Dr. Storms and other LENR topics by the Utah News Team and Good Morning America; 3) the DOE proposal described for Phase 2 (Hanson, 1994); and 4) Miley data (which actually belongs in Phase 5).

The hard-copy records include primarily correspondence with other LENR researchers. A set of records titled “ENECO” is also in the hard-copy records, along with a set with the name “Bankruptcy”, which also apply to ENECO. The LENR Library has the proceedings for ICCF Conferences #5 (1995, Champaign, Illinois,) and #6 (1996) as well as the 2nd Conference on Low-Energy Nuclear Reactions (1996, College Station, Texas), and for an Asti Workshop on Anomalies in Hydrogen/Deuterium Loaded Metals (1997, Bologna, Italy).

4.4 Phase 4. Independent Investigation 2 (3/1998 – 6/2000)

Following his February 1998 separation from ENECO, Dr. Storms continued LENR research in his home lab independently. This phase continued until about July 2000, when he started his work with Lattice Energy. He periodically received financial support from Charles Entenmann

during Phase 4 and continuing until about November 2001.

During Phase 4, Dr. Storms attended ICCF Conferences #7 (1998, Vancouver, BC) and #8 (2000, Lerici (La Spezia), Italy) as well as a Conference on Future Energy (COFE, 1999) in Washington, D.C.

Publications and Reports

Dr Storms' publications and unpublished progress reports for Phase 4 generally included the years 1998 to 2000.

Storms, E.K. Relationship between open-circuit-voltage and heat production in a Pons-Fleischmann cell. in The Seventh International Conference on Cold Fusion. 1998. Vancouver, Canada: ENECO, Inc., Salt Lake City, UT. p. 356.

Storms, E., Cold fusion revisited. *Infinite Energy*, 1998. 4(21): p. 16-29.

Storms, E.K., Formation of β -PdD containing high deuterium concentration using electrolysis of heavy-water. *J. Alloys Comp.*, 1998. 268: p. 89.

Storms, E., Factors affecting heat production in a Pons-Fleischmann Cell. ICCF-7, April 1998.

Storms, E., My life with cold fusion as a reluctant mistress. *Infinite Energy*, 1999. 4(24): p. 42.

Storms, E., Anomalous heat generated by electrolysis using a palladium cathode and heavy water in American Physical Society. 1999. Atlanta, GA.

Storms, E., Cold fusion: Theory and practice in Japan. *21st Century Sci. & Technol.*, 1999. Spring: p. 82.

Storms, E., Proposal for study of palladium powder at UNM. 1999.

Storms, E.K., The present status of chemically assisted nuclear reactions. in ACS. 1999. Ontario, CA.

Storms, E.K., New Method for initiating nuclear reactions. in Conference on Future Energy. 1999. Bethesda, MD.

Storms, E., Excess power production from platinum cathodes using the Pons-Fleischmann effect. in 8th International Conference on Cold Fusion. 2000. Lerici (La Spezia), Italy: Italian Physical Society, Bologna, Italy. p. 55-61.

Storms, E., A critical evaluation of the Pons-Fleischmann effect: Part 1. *Infinite Energy*, 2000. 6(31): p. 10.

Storms, E., A critical evaluation of the Pons-Fleischmann effect: Part 2. *Infinite Energy*, 2000. 6(32): p. 52.

Storms, E.K., Description of a dual calorimeter. *Infinite Energy*, 2000. 6(34): p. 22.

Storms, E., The present status of chemically-assisted nuclear reactions. *Infinite Energy*, 2000. 5(29): p. 26.

Storms, E., Where do we stand on cold fusion? 21st Century Sci. & Technol., 2000. Winter: p. 76.

Hansen, L.D., S.E. Jones, J.M. Thorne, and E. Storms., Cooperative investigation of anomalous effects in Pd/LiOD electrolytic cells. 2000.

The unpublished progress reports for Phase 4 are from 2000.

<u>Title</u>	<u>File Name</u>
(1/9/2000)	History of flow calorimeter
(9/12/2000)	History of composi
(9/12/2000)	loading based on oil
(9/12/2000)	Pd history
(9/12/2000)	Pd property summary
(11/10/2000)	History of Miley Tests

Research Record

The Phase 4 research record extends generally from 1998 to 2000. Several items indicate that Phase 5 (Lattice Energy) started in the latter part of 2000 (e.g. “Miley Study Initiated“ in work history, September 2000 and “History of Miley Test“, an unpublished progress report, November 2000.

The samples examined during Phase 4 as indicated by the work history were primarily palladium with other materials (e.g. Pd-W2.3, Pd-Al2.5, Pd-Ag#7, PdB(0.75%)). Samples of palladium, platinum, nickel, and titanium (e.g. Pd#24, Pt#11, Ni#6, and Ti#1) were also studied. Electronic files were found on several of the legacy media except the floppy disks – ZIP discs, CDs, the external hard drive, and DVDs. The most significant electronic files included the following: 1) a study of Ag on C; 2) broad-based storage folders (e.g. “Work in Progress”, “Current Articles”, “Calorimeter Study”, “Archive, General”; 3) digital pictures; 4) conference files (American Chemical Society, 1999; ICCF-8, 2000); 5) Ed’s website (which may be found at <http://home.netcom.com/~storms2/index.html>) but has not been active for a long time); and 6) Gene Mallove interview of Dr. Storms (April 15, 2000).

The hard-copy records for Phase 4 include a variety of materials, including papers, reports, and presentations by Dr. Storms, a study with John Dash using titanium (“Ti Study Dash“), letters from Entenmann, and correspondence with other LENR researchers. Dr. Storms’ LENR Library contains the proceedings of ICCF #7 and #8, and the First International Conference on Future Energy (COFE, 1999, Washington, DC).

4.5 Phase 5. Lattice Energy (7/2000 – 2/2006)

Phase 5 began when Dr. Storms was approached by Lew Larson of Lattice Energy in July 2000 to conduct independent assessments of LENR work being performed by Larson's associate, Dr. George Miley of the University of Illinois. After the assessments came to an end, Dr. Storms continued work with Lattice, conducting many types of experiments on a large variety of materials. This extensive work continued until Larson withdrew financial support in February 2006. Dr. Storms joined Lattice Energy as a Senior Scientist in April 2003, and a written agreement between Dr. Storms and the company was prepared in June 2004.

While he was conducting the independent confirmation of Dr.'s Miley's research, Dr. Storms found an apparent error in the method by which Miley and his colleague in LENR research, Andre Lipson, were calculating excess energy. Discussions among the participants did not result in a resolution of the issue.

Many progress reports were prepared during by Dr. Storms during his research for Lattice Energy. He also received a scanning electron microscope (SEM) equipped with energy dispersive x-ray (EDX) capability to support the investigations. He was able to continue the SEM and EDX component of his LENR research after the end of his support from Lattice Energy, and he continues to use the equipment to this day. Despite many experiments with a large variety of materials and methods using electrolytic cells, reproducible energy was not achieved.

An important component of Dr. Storms' research during his work with Lattice Energy was the "Case Study". Les Case was a retiree from a prominent catalyst production company who conducted LENR experiments utilizing his background in catalysts. He developed a method that used drums of charcoal made from coconuts from an island in the Pacific Ocean. This method utilized a palladium chloride solution that was deposited on the charcoal particles. After observing excess heat, Case requested Michael McKubre, LENR researcher at SRI International, confirm his work. When this confirmation was found to be a success, Dr. Storms asked to conduct an additional check. He performed many experiments with the charcoal and palladium chloride solution, and at one point received guidance from Dr. McKubre on specific procedures. Dr. Storms was not able to confirm the occurrence of LENR in the Case Study.

Following his support of Dr. Storms' research, Larson changed his focus to developing a LENR explanation. His collaboration with Allan Widom resulted in the Widom-Larson theory, one of the best-known explanations in the LENR field.

Dr. Storms developed a website, “Taking the Chill Out of Cold Fusion“, in the 2001 timeframe. The website is still available⁸⁸, although it has not been updated for several years. It contains a number of photos of Dr. Storms’ lab experiments (with electrolytic cells) and about a dozen of his cold fusion papers prepared from about 1996 to 2001. A complete list of Dr. Storms’ publications, including papers and books from his pre-LENR research on high-temperature refractory materials, is also on the website.

During Phase 5, Dr. Storms attended ICCF-10 (2003, Cambridge, Massachusetts), ICCF-11 (2004, Marseilles, France), and ICCF-12 (2005, Yokohama, Japan). He received the Preparata Medal during ICCF-12. He did not attend ICCF-9, which took place in Beijing, China in 2002. He also presented papers at other conferences, including the American Physical Society (2001, Seattle Washington; 2003, Austin, Texas; 2005, Tucson, Arizona). He presented short courses (“An Update of LENR“) at ICCF-10 and ICCF-11. He also co-authored a paper with Jed Rothwell on the LENR-CANR.org website, which have been created by Rothwell based primarily on publications in Dr. Storms’ LENR Library⁸⁹. After the US DOE held a second review of LENR in 2004 (with similar findings to the original 1989 ERAB review), Dr. Storms wrote a highly critical commentary on the review.

Publications and Reports

The period of publications and other reports for Phase 5 was generally from 2001 to 2005. As noted in the previous section, some of the progress reports started in the latter part of 2000.

Storms, E., Cold fusion: An objective assessment. www.LENR-CANR.org, 2001.

Storms, E.K. Ways to initiate a nuclear reaction in solid environments. in American Physical Society Meeting. 2001. Seattle, WA. p.

Storms, E.K., Review of paper by Shanahan. 2001.

Storms, E., Cold fusion, the next big step up the energy letter. Submitted to 21st Century Science

⁸⁸ <http://home.netcom.com/~storms2/index.html>.

⁸⁹ Rothwell, J., and E. Storms, 2003. The LENR-CANR Website, Its Past and Future. Proceedings of ICCF-10, p. 939-942. August.

and Technology. June 2002.

Storms, E., The nature of the nuclear-active-environment required for low energy nuclear reactions. *Infinite Energy*, 2002. 8(45): p. 32.821

Storms, E., Ways to initiate a nuclear reaction in solid environments. *Infinite Energy*, 2002. 8(45): p. 45.

Storms, E. Why cold fusion has been so hard to explain and duplicate. in American Physical Society Winter Meeting. 2003. Austin Convention Center, Austin, TX: unpublished. p.

Storms, E., A student's guide to cold fusion. 2003, LENR-CANR.org.

Storms, E.K. How to make a cheap and effective Seebeck calorimeter. in Tenth International Conference on Cold Fusion. 2003. Cambridge, MA: World Scientific Publishing Co. p. 269.

Storms, E.K. Use of a very sensitive Seebeck calorimeter to study the Pons-Fleischmann and Letts effects. in Tenth International Conference on Cold Fusion. 2003. Cambridge, MA: World Scientific Publishing Co. p. 183.

Storms, E.K. What conditions are required to initiate the LENR effect? in Tenth International Conference on Cold Fusion. 2003. Cambridge, MA: World Scientific Publishing Co. p. 285.

Rothwell, J. and E.K. Storms. The LENR-CANR.org website, its past and future. in Tenth International Conference on Cold Fusion. 2003. Cambridge, MA: World Scientific Publishing Co. p. 939.

Storms, E.K. Cold fusion has now come out of the cold. in APS. 2003. p.

Storms, E.K. My history with cold fusion. 2003.

Storms, E., Calorimetry 101 for cold fusion. 2004, www.LENR-CANR.org.

Storms, E. An update of LENR for ICCF-11 (Short Course, 10/31/04). in 11th International Conference on Cold Fusion. 2004. Marseilles, France: World Scientific Co. p. 11.

Storms, E.K., Study of electrodeposition on a Pt surface, P. Report, Editor. 2004, Lattice Energy.

Storms, E., Cold Fusion – the Experimental Evidence. 21st Century. Winter 2004-2005.

Storms, E., A response to the review of cold fusion by the DoE. 2005.

Storms, E., Cold fusion for dummies. www.LENR-CANR.org, 2005.

Storms, E. Why I believe "cold fusion" is real. in American Physical Society. 2005. Tucson, AZ.

Storms, E., Description of a Seebeck calorimeter. 2005: www.LENR.org.

Storms, E.K., Description of a sensitive Seebeck calorimeter used for cold fusion studies. in Condensed Matter Nuclear Science, ICCF-12. 2005. Yokohama, Japan: World Scientific. p. 108.

Storms, E., Construction details of a new design for a Seebeck Calorimeter. 2005.

Storms, E., How to cause nuclear reactions at low energy and why you should care. 2005.

Storms, E., undated. Study of Deuterium Activity Changes Produced in Metals When Electrolyzed in LiOD. Lattice Energy Unpublished Paper.

Storms, E., 1996. The Nature of the Nuclear Active Environment For LENR. Lattice Energy Unpublished Paper.

Phase 5 includes a large number of unpublished progress reports prepared by Dr. Storms to convey results of his research to Lew Larsen of Lattice Energy.

<u>Title</u>	<u>File Name</u>
(1/20/2001)	Progress Report 1/19/01
(1/21/2001)	Progress Report 1/20/01
(1/25/2001)	Progress Report 1/25/01
(2/1/2001)	Progress Report 1/31/01
(2/8/2001)	Progress Report 2/8/01
(2/17/2001)	Progress Report 2/16/01
(3/2/2001)	Progress Report 3/2/01
(4/15/2001)	Progress Report 4/15/01
(5/5/2001)	Progress Report 5/5/01
(12/20/2001)	Progress Report 12/1/01
PROGRESS REPORT. 9/28/01 to 12/21/01. (12/21/2001)	Progress 12/21/01
Case Study, EKS Progress Report No. EKS 2-1-02 (2/1/2002)	Progress 9/01-2/02 N
[Several anomalous effects were seen.] (2/9/2002)	thermal arrests
(2/14/2002)	Progress Report 2/14/01
(3/13/2002)	Progress Report 3/13/01
(8/30/2002)	8/30/02 progress report
[Letts Study report] (12/18/2002)	Labreport2001.efx
TRIP REPORT, APS MEETING, AUSTIN, TX, 3/6/03-3/8/03(3/8/2003)	TRIP REPORT
Evaluation of the Calorimeter Used by G. Miley (3/25/2003)	COMMENTS ON CALORIMETER OF GM
LENR Reaction Product "Signature"... (6/16/2003)	Miley Dr George – Various charts
(6/16/2003)	Miley spectrum
(6/16/2003)	Miley spectrum(2)
Memorandum: Replication of the Miley claims (6/16/2003)	Miley replication
PROGRESS REPORT. Test of samples prepared by Prof. Miley. (10/25/2003)	PROGRESS REPORT 10
PROGRESS REPORT. 10/25/03 (10/25/2003)	Word Work File D 2310
PROGRESS REPORT. 10/25/03. Test of samples prepared by Prof. Miley. (10/25/2003)	PR#10, 10-25-03(Miley)
PROGRESS REPORT. Test of an electrolyte using D2SO4. (11/16/2003)	PROGRESS REPORT 11
PROGRESS REPORT 11/16/03. Test of an electrolyte using D2SO4. (11/16/2003)	PR#11, 11-03-03(H2SO4)
PROGRESS REPORT 12/21/03) (12/21/2003)	PR#12, 12-21-03
PROGRESS REPORT. HISTORY OF PT DOT 6 (1/12/2004)	HISTORY of Pt Dot 6.doc
PROGRESS REPORT 1/14/04 (1/14/2004)	PR#13, 1-14-04
A Discussion of Those Variables that Affect the Nuclear Active Environment. (2/1/2004)	A Discussion of Those Variables
PROGRESS REPORT OF Pt 2/9/04. HISTORY OF EXPERIMENTS STARTING 2/3/04 (2/9/2004)	HISTORY OF EXPERIMENTS STARTING
Summary of Results. (2/9/2004)	Summary of Results(2/3/04)
PROGRESS REPORT. HISTORY OF EXPERIMENTS STARTING 2/3/04. (2/9/2004)	Progress Report Pt 3-9-04.doc
PROGRESS REPORT. HISTORY OF EXPERIMENTS STARTING 2/3/04. (2/9/2004)	Word Work File D 1
EXAMPLES OF SEM PICTURES (5/16/2004)	MEMO, SEM 5-16-04.DOC

PROGRESS REPORT. HISTORY OF EXPERIMENTS STARTING 2/3/04. (7/5/2004)	PROGRESS REPORT Pt 2-3-04
PROGRESS REPORT. 7/19/04. Test of samples prepared by Prof. Miley. (7/19/2004)	PROGRESS REPORT, 7-19-04.doc
PROGRESS REPORT. 8/19/04. Study of electrodeposition on a Pt surface. (8/19/2004)	PR 8-19-04.doc
PROGRESS REPORT. 8/19/04. Study of electrodeposition on a Pt surface. (8/19/2004)	PR 8-19-04.jpg pics.doc
PROGRESS REPORT. 8/29/04 (8/29/2004)	PR#8-29-04.doc
HISTORY OF PT DOT 4. Run in Cell #2, Small SB #1, Pd anode. Cell cleaned with ... (9/3/2004)	HISTORY OF Pt Dot 4.doc
PROGRESS REPORT. A collection of questions. (9/10/2004)	PR 9/10/04
PROGRESS REPORT. 9/20/04. HISTORY OF EXPERIMENTS STARTING 9/3/04 (9/30/2004)	PROGRESS REPORT 9(2).doc
HISTORY OF PT DOT 3. Seebeck #1 cell #2 with Pd anode and containing... (11/16/2004)	HISTORY of Pt Dot 3.doc

Research Record

The research record for Phase 5 encompasses generally the years 2001 to 2005. The record, as indicated by the work history, shows extensive experiments with platinum (e.g. PtC, PtD, Pt#26#3, Pt#22#13, Pt-2-1, Pt-4-1) early in Phase 5. The Case Study started in October 2001, as indicated by work history notations for Cell #1, #2, #3, #4, and #5. These experiments continued until early 2003. At the same time, parallel experiments continued with other samples (probably palladium) as indicated by samples EKS001, 002, 004, 005, etc. Later in 2003 and thereafter, additional work was done with platinum and palladium alone and with gold (e.g. Pd#64+Au, Pt+Pd, Pd+Au, Pt(9-10-4, PdDot2). In the latter part of Phase 5, Dr. Storms did additional experiments with palladium samples received in the 1990s from IMRA (e.g., IMRA #60, #88, #93, #94). There are also entries in the work history indicating experiments involving Miley's samples as well as with a cell from Dennis Letts in 2002 and 2003.

The electronic data files are on most of the legacy media, particularly the ZIP disks, CDs, and the external hard drive. One of the ZIP disks and the external hard drive record have records of the Case Study (August 2003). Similarly in the same timeframe, files were created for the Miley study (e.g. "Miley", "Miley Study", "Miley Data", "Miley pictures, 2004"). Several electronic files folders and files were created for the work Dr. Storms was performing with Lattice Energy (e.g. "Lattice, 2003"; "Proposed Research Plan for Lattice Energy, 2003"). Many unpublished progress reports are also among the electronic data files. The files also contain materials from

ICCF-11 (2004) and ICCF-12 (2005). A 1994 ZIP or CD contains a collection of the PDF files of papers from Dieter Britz's collection, which Dr. Storms was adding to the EndNote collection of files for his LENR Library.

The hard-copy record includes a variety of research-related items, including coverage of the Case Effect Study (2001-2002), a collection of materials on Lattice Energy (2003-2005), Lattice Energy Progress Reports, correspondence with other LENR researchers, materials for the ICCF-10 Short Course, the Lattice Energy agreement, and a collection of non-disclosure agreements.

The LENR Library contains a number of important materials for the field, particularly the proceedings for ICCF-9 (2002, Beijing, China), ICCF-10 (2003, Cambridge, Massachusetts), ICCF-11 (2004, Marseilles, France), and ICCF-12 (2005, Yokohama, Japan). The Library also has a copy of Dr. Storms' rejection history of one of his papers that have been submitted to a prominent journal, the program for the 4th Meeting of the Japan CF Research Society (2002), the Integrity Research Institute's "Collected Works of Edmunds Storms about the Science of Chemically Assisted Nuclear Reactions", and a bulletin of the American Physical Society containing a paper by Dr. Storms (2003).

4.6 Phase 6. Independent Investigation 3 (3/2006 – 2/2007)

After Lattice Energy withdrew financial support in February 2006, Dr. Storms continued his LENR research on a self-supported basis. This phase continued for a bout a year (2006) until he started working with Brian Scanlon in February 2007. There was no ICCF Conference in 2006 for Dr. Storms to attend. There was not ICCF Conference in 2006 for Dr. Storms to attend.

Publications and Reports

Only one publication is recorded for Dr. Storms for 2006.

Storms, E., Comment on papers by K. Shanahan that propose to explain anomalous heat generated by cold fusion. *Thermochim. Acta*, 2006. 441(2): p. 207-209.

Research Record

The research record for Phase 6 was developed generally in 2006. Two types of samples were being run according to the work history - IMRA samples obtained during Phase 2 and re-run during this phase (e.g. IMRA #6, #9, #16A, #77B) and palladium samples with other materials e.g. Pd+zeolite, Pd+CaCl₂, Pd+CaO, Pd+SrCl₂).

The electronic files are mostly on ZIP disks and CDs and include files from the Dieter Britz collection of LENR papers and documents obtained during preparation of Dr. Storms' first book, which was published in the next phase. Lattice Energy Progress Reports from the previous phase are also present for the early part of 2006. One folder from Dr. Storms' computer is also on one of the CDs: "Old Data: 2006".

The hard-copy records include pages for "Anomalous Heat Produced by Electrolytic Electrolysis of Palladium Using a Heavy-Water Electrolyte", two items consisting of materials related to Dr. Storms' 2007 book, and items for a trip to the Naval Research Laboratory ("NRL trip, 10).

4.7 Phase 7. Kiva Labs (3/2007 – 3/2012)

Dr. Storms met Brian Scanlon at one of the LENR conferences, and they agreed to pursue research jointly. Mr. Scanlon began providing support for Dr. Storms' lab in February 2007 while he continued research in his own lab. This support continued until March 2012, when Scanlon's budget for LENR research was exhausted. The collaboration included many experiments using a variety of methods, starting with electrolytic cells. Subsequently, the gas discharge and gas loading methods were also utilized. Research after early 2011 focused on attempts to achieve LENR with nickel-hydrogen gas loading setups similar to those used by Andrea Rossi in demonstrations starting in January of that year. The collaboration was changed to a more formal relationship when a company, KivaLabs, was created.

One of the most important accomplishments of Dr. Storms during Phase 7 was the publication of his first book on LENR, "The Science of Low Energy Nuclear Reactions" in 2007. He also gave presentations in Catania, Sicily, Italy (noted above), at the American Physical Society (2008, New Orleans), and at the University of Missouri (2009, Columbia, Missouri).

Publications and Reports

Dr. Storms prepared many publications in Phase 7, several of them jointly with Brian Scanlan. No unpublished reports have yet been recorded.

- Storms, E.K. and B. Scanlan. Radiation produced by glow discharge in deuterium (Part 1). in 8th International Workshop on Anomalies in Hydrogen / Deuterium Loaded Metals. 2007. Catania, Sicily: <http://www.iscmns.org/catania07/index.htm>. The International Society for Condensed Matter Science. p. 297-305.
- Storms, E.K., The science of low energy nuclear reaction. 2007, Singapore: World Scientific. 312.
- Storms, E.K. The science of low energy nuclear reactions. in APS, March Meeting. 2007. Denver, CO.
- Storms, E.K., How to explain cold fusion?, in ACS Symposium Series 998, Low-Energy Nuclear Reactions Sourcebook, J. Marwan and S.B. Krivit, Editors. 2008, American Chemical Society: Washington, DC. p. 85.
- Storms, E.K. and B. Scanlan. Radiation produced by glow discharge in a deuterium containing gas (Part 2). in American Physical Society Conference. 2008. New Orleans.
- Storms, E.K. and B. Scanlan. Radiation produced by glow discharge in a deuterium containing gas (Part 2). in American Physical Society Conference. 2008. New Orleans. p. Presentation.
- Storms, E.K. and B. Scanlan. Detection of radiation from LENR. in 14th International Conference on Condensed Matter Nuclear Science. 2008. Washington, DC: www.LENR.org. p. 261-287.
- Rothwell, J. and E.K. Storms, Report on Arata's paper and lecture about his "solid fusion" reactor. www.LENR-CANR.org, 2008.
- Storms, E.K. The method and results using Seebeck calorimetry. in ICCF-14 International Conference on Condensed Matter Nuclear Science. 2008. Washington, DC: www.lenr.org. p. 11-25.
- Storms, E., CASE STUDY – Cold Fusion. Unpublished Presentation. 2008.
- Storms, E.K. An informed skeptic's view of cold fusion. in Vice Chancellor for Research Seminar Series: Excess Heat and Particle Tracks from Deuterium-loaded Palladium. 2009. Univ. of Missouri.
- Storms, E.K. An informed skeptic's view of cold fusion. in Vice Chancellor for Research Seminar Series: Excess Heat and Particle Tracks from Deuterium-loaded Palladium. 2009. Univ. of Missouri. Presentation
- Storms, E.K., What is known about cold fusion? www.LENR-CANR.org, 2009.
- Storms, E.K. and B. Scanlan. Role of cluster formation in the LENR process. in 15th International Conference on Condensed Matter Nuclear Science. 2009. Rome, Italy: ENEA. p. 331-336.
- Storms, E.K. and B. Scanlan. Role of cluster formation in the LENR process. in 15th International Conference on Condensed Matter Nuclear Science. 2009. Rome, Italy: ENEA. p. 331-336. Presentation
- Storms, E.K. and B. Scanlan, What is real about cold fusion and what explanations are plausible?, in AIP Symposium Series, J. Marwan, Editor. 2010, Am. Inst. of Phys.

- Marwan, J., et al., A new look at low-energy nuclear reaction (LENR) research: a response to Shanahan. *J. Environ. Monit.*, 2010.
- Storms, E.K., The status of cold fusion (2010). *Naturwissenschaften*, 2010. 97: p. 861.
- Storms, E.K. and T.W. Grimshaw, Judging the validity of the Fleischmann–Pons effect. *J. Cond. Matter Nucl. Sci.*, 2010. 3: p. 9-30.
- Storms, E., PROGRESS REPORT, SrTiO₃+Pd #1, 9/1/10 to 10/2/10. Unpublished Report. 2010.
- Storms, E.K. Examination of errors that occur when using a gas-filled calorimeter. in ICCF-16. 2011. Chennai, India: <http://lenr-canr.org/acrobat/StormsEexaminatio.pdf>. p.
- Storms, E.K. and B. Scanlan, What is real about cold fusion and what explanations are plausible? *J. Cond. Matter Nucl. Sci.*, 2011. 4: p. 17-31.
- Storms, E.K., What is now known about cold fusion? (Addendum to the Student's Guide). 2011, www.lenr.org.
- Srinivasan, M., G. Miley, and E.K. Storms, Low-energy nuclear reactions: Transmutations, in *Nuclear Energy Encyclopedia: Science, Technology, and Applications*, S. Krivit, J.H. Lehr, and T.B. Kingery, Editors. 2011, John Wiley & Sons: Hoboken, NJ. p. 503-539.
- Storms, E., The fall and rise of cold fusion. 2011.

Research Record

The Phase 7 research record was created generally during 2007 to 2011. Experiments in Dr. Storms' LENR lab as recorded in his work history utilized the electrolytic method and, starting in 2008, the gas loading method. The early electrolytic cell work utilized primarily palladium along with other elements and compounds (e.g., PdB#2, Pd with Li₂O, Pt coated with Pd, Cu sputtered with Pd, Al₂O₃+Pd). Many experiments with different metals and compounds were used throughout the rest of Phase 7 (e.g. CeO#2, ZrO₂+Pd(NO₃)₂, Al₂O₃+Pd, Li₂CO₃, Pd on CaCO₃). The record also includes work with Dennis Letts' Cells 672, 674, 675, and 676 in late 2008 and early 2009.

The electronic files are primarily from CDs, DVDs, and Dr. Storms' current computer. The DVDs include materials from ICCF-14 and ICCF-15. The files from the current computer are generally in two folders, "Old Data" and "Data". Examples of the contents of "Old Data" are files from 2007, 2008, and 2009 as well as folders with the names "Gas Discharge", "Optical Spectrum", "DAQ", and "Pd-Ni-Cu Radiation". The "Data" file has in it folders with the names "Laser #2", "(10/25/09)", "Seebeck", "10/30/09", "Theory of LENR", "Seebeck Design", and "Letts".

The hard-copy files include a large collection entitled "Glow Discharge 2007", "Information on Catania Meeting, 10/07", an envelope labeled "Patent with Brian Scanlon", correspondence

with other researchers, files termed “Radiation Produced by Glow Discharge”, “Review of Papers 2009-2014”, “EDX Plots and SEM Images”, “EDX Plots, 2010-2011”, “KivaLabs Progress Reports, and reports entitled “Cold Fusion Studies”, “What Is Real about Cold Fusion”, and “The Path toward a Plausible Theory of Cold Fusion”.

The LENR Library has proceedings for ICCF-14 (2008, Washington, DC), ICCF-15 (2009, Rome, Italy), and ICCF-16 (2011, Chennai, India). The Library also has the proceedings of the 8th International Conference on Anomalies in Hydrogen/Deuterium Loaded Metals (2007, Sicily, Italy) and a pre-print of a chapter in Volume 1 of the Wiley Encyclopedia of Energy and Technology (“Low Energy Nuclear Reactions: Transmutations”).

4.8 Phase 8. Independent Investigation 4 (4/2012 – 12/2015)

When the KivaLabs collaboration ended in February 2012, Dr. Storms continued his LENR research once again on a self-supported basis. Phase 8 continued until the cutoff date for the Project in December 2015.

Dr. Storms became interested in forming a new LENR lab outside his home and located closer to the more developed part of Santa Fe. He was joined in this effort by Dr. Grimshaw in the late 2013, and a draft proposal for the Santa Fe LENR Laboratory was prepared in 2013⁹⁰. A subsequent initiative that included Drs. Tom Claytor and Malcolm Fowler was given the name "CSFG Collaboration". A draft proposal⁹¹ also called for a Phase 1 lab in Dr. Claytor's current lab in White Rock and Phase 2 lab in Santa Fe. When funding was not received for the second proposal, Dr. Storms and Dr. Grimshaw began work on the Storms LENR Research Documentation Project. Dr. Grimshaw subsequently utilized the name LENRGY for an LLC in Texas and received a trademark in 2017. Dr. Storms constructed a new Seebeck calorimeter and performed a series of calibrations and LENR experiments, which were described in a series of Progress Reports posted on the CMNS Google Group blog from July to September 2015⁹².

⁹⁰ “Proposal for a LENR Research Laboratory, Los Alamos (Stage 1) and Santa Fe (Stage 2), New Mexico”. Santa Fe LENR Laboratory Proposal by Edmund Storms, Tom Claytor, and Tom Grimshaw, December 12, 2013.

⁹¹ "Investigation of LENR for Energy Production". CSFG Collaboration (Thomas Claytor, Edmund Storms, Malcolm Fowler, and Tom Grimshaw, May 14, 2015.

⁹² “Study of PdD as a Host for LENR” Series of 6 Memos by Edmund Storms posted to the CMNS Google Blog, July 30 to September 30, 2015.

- Part 1. Description of the Calorimeter (July 30, 2015)
- Part 2. Calibration of the Calorimeter Used to Study Sources of LENR Energy (August 9, 2015)
- Part 3. Insights Obtained during the Initial Study (August 21, 2015)
- Part 4. Initial Studies Showing the Effect of Important Variables (September 1, 2015)
- Part 5. Behavior of Pure PdD (October 1, 2015)
- Part 6. Additional Behavior of Pure PdD (September 30, 2015)

A principal accomplishment of Dr. Storms in Phase 8 was publication in 2014 of his second book, “The Explanation of Low Energy Nuclear Reaction”. Also, he attended ICCF-18 in Columbia, Missouri in 2013, but he did not go to ICCF-17 (2012, Daejeon, South Korea) or ICCF-19 (2015, Padua, Italy).

Publications and Reports

The publications prepared by Dr. Storms in Phase 8 are shown below.

- Storms, E.K., A student's guide to cold fusion, revised. 2012: www.LENR.org.
- Storms, E.K., An explanation of low-energy nuclear reactions (cold fusion). J. Cond. Matter Nucl. Sci., 2012. 9: p. 85-107.
- Storms, E.K., Student's guide. 2012, www.LENR.org.
- Storms, E.K., Explaining Cold Fusion. In 18th International Conference on Condensed Matter Nuclear Science. 2013. Columbia, MO.

Research Record

The record for Phase 8 includes generally the years 2012 to 2015. Dr. Storms continued his lab research in LENR using methods similar to those he had been utilizing in the preceding phase. Both the gas loading and then the electrolytic cell techniques were employed. Many metals and compounds were used separately and in combination (e.g. Ni+CO+H₂, Ni+CO+He#3, Cr₂O₃+H₂+CO, Ni+Zr, Ni₂₅₅, Pd+Ni, Pd#6A, Pd powder+ZrO₂).

The electronic files are from Dr. Storms’ current computer and consist mostly (as in the previous phase) of files in the folder “Old Data“ (e.g. “12/7/2012”, “DotNi+Cu(8-29-13)”, “Ni powder SEM”, “Pd on Si disc study”, “sputtering discharge”. The hard-copy records include several types of materials (e.g. “Mass Sweep Plots, 2011-2012”, papers entitled “An Explanation of Low Energy Nuclear Reactions (Cold Fusion)”, “The Nature of Radiation Remitted from Nickel Exposed to Hydrogen”, “A Potential Source a Perfect Energy”, and “Cold Fusion from a Chemist’s Point of View”. These records also have copies of a “NASA Contract, 2013-2014”,

“Hagelstein Correspondence”, “Sven Thatje Email”, “Cooper Life Sciences, 2014”, “Prometheus Fusion Laboratory”, “Infinite Energy Book Contract, 2014”, and “LENRGY Laboratory Preparation Materials, 2014”.

The LENR Library has the proceedings for the “International Low-Energy Nuclear Reactions Symposium” (2012, Williamsburg, Virginia), ICCF-18 (2013), and “Low-Energy Nuclear Reaction Introductory Short Course: (2013, National Security Innovation Center).

5 *Future Opportunities and Next Steps*

There are a number of opportunities for additional description, analysis, and interpretation of Dr. Storms' LENR research from the earliest weeks of the field through 2015. Almost all of the Project Components could be documented in greater detail, and the associated timelines could be further refined, leading to a more complete Integrated Timeline. In particular, the relationship among the Components could be further analyzed and a more complete picture of the research and results developed. For example, the lab activities recorded in the lab notebooks (work history) could be related directly to the experimental data generated as documented in the electronic data files and hard-copy records. Since the cutoff date for the Project is December 31, 2015, the effort could be extended for 2016 and 2017. Some of the Components, including the Round 2 hard-copy files and Dr. Storms' interviews, have not yet had timelines prepared.

Technical analysis and interpretation could be another fruitful area for further development. For example, the information may be amenable for study for a graduate thesis or dissertation to derive more value from the work performed by Dr. Storms. He has, in fact, noted that further review and analysis by himself may result in new insights or discoveries. Additional analysis will become more important as the prospects for LENR realization improve over time and continued by research by Dr. Storms and others. A permanent location for the hard-copy and electronic records will be advisable, such as a repository at a qualified and interested university.

6 Conclusions: Dr. Storms' Contribution to Eventual LENR Realization

Dr. Storms took an early interest in LENR research and has worked diligently in the field for the 29 years since its 1989 announcement. His 30+ years of work yet high-temperature materials research at LANL provided an unparalleled foundation for LENR research. His training and research as a nuclear chemist made him especially well-qualified to understand LENR, which almost certainly involves both the electron shell (chemistry) and the nucleus (nuclear physics) of the atoms involved in the reaction. His research into the phenomenon while still at LANL resulted in success in achieving LENR as indicated by the signatures of tritium production and excess heat generation. He and Tom Claytor led the two teams that had success at LANL, and both continue to research the phenomenon to this day.

Dr. Storms has made many contributions with both sophisticated experiments and advanced explanations of the LENR phenomenon. He has developed a sophisticated home laboratory in which he has conducted experiments employing all the methods known to produce LENR using its various signatures, including excess heat, radiation, tritium production, and elemental transmutation. His novel exclamations, such as the nanocrack and hydroton idea for nuclear reaction, conform generally to current scientific understanding but also push into the frontiers of new knowledge. He has enjoyed the sponsorship from a number of supporters having various motivations such as scientific advances and commercial success. He has been successful in achieving well-documented LENR using several different experimental set ups and signatures.

Dr. Storms has written two books and he has published many papers as well as unpublished reports on experimental findings and their interpretation for creative explanation. He has developed and maintains perhaps the most complete library of LENR publications in existence today.

Dr. Storms has served as a vital member of the LENR research community from the very beginning. He has provided intellectual and other support to other investigators, and he has been willing to share his expertise and insight freely. He has attended all but a handful of the 20 ICCF conferences starting with the first one in 1990.

The future of humankind may well depend on achieving LENR and realizing its benefits as a clean, abundant, and inexpensive source of energy. Society will owe a great deal to Dr. Storms when LENR becomes a reality it is widely deployed as a source of energy.

Appendix A. Project Methods

Standard project management practices were used for the Project insofar as possible. An incremental approach was used since the full scope of the research materials was not known in advance. The Project began in August 2015⁹³ when Dr. Grimshaw made his first visit for information collection. The overall objective is to collect and organize Dr. Storms' research files and make them more readily accessible. The Project covers the period from March 1989 through December 2015.

A-1 Information Retrieval

As noted in Section 1, the Project is being conducted in three stages - information collection, organization, and documentation (Final Report). A report is being prepared for each stage. Much of the work was done at Dr. Storms' home laboratory in Santa Fe, New Mexico. In addition to the work accomplished onsite at Dr. Storms' home lab, tasks were also performed at the Energy Institute, such as scanning of hard-copy materials and preparing Project reports. Trips were made from Austin to Santa Fe for 3 to 7 days at a time to interview Dr. Storms, collect information, and prepare documents:

<u>Trip</u>	<u>Date</u>	<u>Trip</u>	<u>Date</u>
1	August 2015	7	April 2016
2	September 2015	8	August 2016
3	October 2015	9	March 2017
4	December 2015	10	June 2017
5	January 2016	11	October 2017
6	February 2016	12	Planned

During each onsite visit to his home lab, interviews with Dr. Storms took place, and he provided electronic files from several kinds of media, including the hard disk of his current computer, floppy disks, ZIP disks, CDs, and DVDs. He also made available hard-copy files, including LENR publications by himself and other researchers, correspondence files, laboratory notebooks,

⁹³ The Project was actually initiated in the Spring 2015 (“Professional Biography Initiative: Next Step”. Memo to Edmund Storms from Tom Grimshaw, June 10, 2015), but substantive effort began in August.

printed results of experiments, and access to his LENR Library. The hard-copy files are from his office, his current laboratory, and a basement under his home.

A-2 File Management and Storage

The electronic files have been organized and copied into a storage device set up for the Project. The hard-copy files and related materials are in a set of storage tubs in Dr. Storms' home. The sources of the electronic files are from Dr. Storms' current computer and legacy media.

Electronic information has been copied into the storage device using the following organization:

Stage 1	Other Categories
Stage 2	Onsite Visit #8
Stage 3	Onsite Visit #9
Project Components	Onsite Visit #10
Project Memos	Onsite Visit #11
Interviews	

As described in Section 2.4, the Round 1 hard-copy files have been placed in hanging folders in storage tubs that are kept at Dr. Storms' home laboratory. Tubs I to VIII contain the Sets of hard-copy files described for Component 50HCR. The tub contents are summarized as shown below.

<u>Tub</u>	<u>Description</u>	<u>Sets</u>
I	Files from Basement	1-3
II	Files from Basement	4-8
III	Files from Basement	9-16
IV	Files from Basement	17
V	Files from Office	18
VI	Files from Office	19-21
VII	Retired	Sets Moved to Other Tubs
VIII	Files Added or Reorganized	22-32
IX	Lab Notebooks and 2014 Book (Preprints)	--
X	Extra Copies of LENR Magazines	--
XI	ZIP Disks, CDs, DVDs, External Hard Drive, Floppy Disks	--
XII	Filing Supplies	--

Tubs IX to XII contain materials for other Project Components as shown above⁹⁴.

⁹⁴ Additions to and Reorganization of Electronic Media in Project Storage Tubs". Memo to Edmund Storms from Tom Grimshaw, April 9, 2017.

Subsequently in the Project (Round 2), five boxes of hard-copy files were added to the Project as described in Section 2.4. These boxes were discovered during a search in Dr. Storms' basement storage area for files related to his pre-LENR research at Los Alamos National Laboratory. The files were removed from the boxes, inventoried (Table A-1), and moved to more secure hanging file storage tubs (Tubs A to F). The inventory of the contents has not yet been added to the Timeline for Component 50HDR. The tubs were moved to another small storage area at the bottom of the stairs leading down from the breezeway at your home.

A-3 Reporting

A primary means of reporting for the Project was the reports for the three Stages, which have been prepared on the following dates:

<u>Phase</u>	<u>Draft</u>	<u>Second Draft</u>
1	6/16/2016*	4/18/2017
2	7/29/2016	6/3/2017
3	12/26/2017	2/18/2018

*A Preliminary Draft of the Phase 1 report dated March 16, 2016 was also prepared.

Table A-1. Inventory of Hardcopy Files in Tubs A to F.

<u>Tub</u>	<u>Description</u>	<u>Contents</u>
A	"Receipts for Energy K Systems". From Box 1.	Manila Envelopes. Examples: ICCF-7, ICCF-8, Energy K Systems 2000, Johnson Matthey, APS March 2001.
B	"First Drawer in Guestroom... Cabinet". From Boxes 1 & 2.	Consulting, Book, ENECO. Loose unbound pages related to CF. Small white three ring binder: "Pd B NRL, 2/27/07". Large black three-ring binder: "Publications (Cold Fusion)" by Ed Storms.
C	Loose CF Papers	Need to be reviewed. Placed in six hanging folders.
D	From Box 3.	Two large blue three-ring binders: 1) "Fusion Facts"; 2) Papers. All refractories except 3 on CF ^{95, 96, 97} Two large black 3-ring binders: 3) "Fusion Facts"; 4) "Letters (Cold Fusion)". Several copies of LANL reports on refracture he materials.
E	Three-Ring Binders: 8 White, 2 Dark Blue	E-1. Case Study, 9/28-12/21/01. History of EKS003. Progress Report 9/28/01-12/21/01 Lattice Energy. E-2. Case Study. 12/22/01-?. Data tables and plots. Lattice Energy. E-3. Pt dot 3. 8/4-8/21 (2004). Progress Report, 8/19/04. Lattice Energy. E-4. Pt Dot 3. 9/29/04. Data tables and photos. Lattice Energy. E-5. Pt Dot 5,7. Progress Report, 1/12/04. CD in back pocket. Lattice Energy. E-6. 2004 data. Progress Reports, 5/5/01, 2/16/04. History of Experiments Starting 2/3/04. Lattice Energy. E-7. Pt dot 2. Data Tables. 8/27/04, etc. E-8. Pt Dot 4. Progress Report, 9/20/04. CD in Back Pocket. E-9. Dark Blue Three-Ring Binder. Progress Reports, 2/1/06, 1/1/06, 12/1/05, 10/1/05, 8/26/05, 3/12/05. A Proposed Model for Cold Fusion, 5/1/05. Electrodeposition of Palladium in LIOH, 1/13/05. E-10. Dark Blue 3-Ring Binder. Numerous unidentified transparencies.
F	Three 3½-Inch White Binders	F-1. 2005a. Progress Reports, 6/17/05, 6/10/05. A Proposed Model for Cold Fusion, 5/1/05. Electrodeposition of Palladium on Copper from a Solution Containing LiOH, 5/15/05. Data Tables and Plots. Lattice Energy. F-2. 2005b. Progress Reports, 11/1/06, 11/1/05. Construction Details of the New Design for a Seebeck Calorimeter, 10/14/05. Lattice Energy. F-3. 2005c. Progress Reports, 10/1/05, 9/2/05, 8/4/05. Description of a Sensitive Seebeck Calorimeter Used for Cold Fusion Studies, no date. Proposed Model to Define Conditions Required to Produce Anomalous Energy in a Fleischmann-Pons Cell, 7/9/05. Lattice Energy. F-4. 2005d. Cold Fusion – Jan 1993. Large Green Three-Ring Finder. All data tables and plots. No Progress Reports. Most in binder, but many loose sheets. F-5. Large Black Three-Ring Binder. "A New Method for Initiating Nuclear Reactions" (undated). Biography of Edmund Storms (lengthy list of refractory publications). Large collection of CF papers by Storms. Most appear to be in camp publications collection already.

⁹⁵ Storms, E, and C Talcott, 1990. Electrolytic Tritium Production. Fusion Technology, Volume 17, Page 680. July. ANS Reprint, Cold Fusion Technical Note.

⁹⁶ Storms, E, and C Talcott, 1991. The Effect of Hydriding on the Physical Structure of Palladium and the Release of Contained Tritium. Fusion Technology, Volume 20, Page 248. September. ANS Reprint, Cold Fusion Technical Note.

⁹⁷ Storms, E, 1991. Review of Experimental Observations about the Cold Fusion Effect. Fusion Technology, Volume 20, Page 433. September. ANS Reprint, Cold Fusion Technical Note.

Memos were also prepared to record progress and findings during the course of the Project^{98,99,100,101,102,103,104,105,106,107}. Many of the memos were prepared in conjunction with the onsite visits:

<u>Round</u>	<u>Onsite Visit</u>	<u>Visit Date</u>	<u>Period Covered</u>
1	1 – 7	Several	8/15 – 7/16
2	8	August 2016	8/16 – 3/17
3	9	March 2017	4/17 – 6/17
4	10	June 2017	7/17 – 9/17
5	11	October 2017	10/17

The memos are listed in Table A-2 to A-6, and copies are included in Annex IV of this report.

⁹⁸ “Storms LENR Documentation Project: Status and Next Steps”. Memo to Edmund Storms from Tom Grimshaw, November 1, 2015.

⁹⁹ “Storms LENR Documentation Project: Status and Next Steps”. Memo to Edmund Storms from Tom Grimshaw, December 17, 2015.

¹⁰⁰ “Summary of Meetings During December 19 to 23 Visit.” Memo to Edmund Storms from Tom Grimshaw, December 26, 2015.

¹⁰¹ “Summary of Memos Describing Components of Storms LENR Research Documentation Project”. Memo to Edmund Storms from Tom Grimshaw, February 1, 2016.

¹⁰² “Storms LENR Research Documentation: Status and Proposed Next Steps”. Memo to Edmund Storms from Tom Grimshaw, February 13, 2016.

¹⁰³ “Candidate Photos for Storms LENR Research Documentation Project”. Memo to Edmund Storms from Tom Grimshaw, May 30, 2016.

¹⁰⁴ “Summary of Memos Describing Components of Storms LENR Research Documentation Project (Update)”. Memo to Edmund Storms from Tom Grimshaw, June 1, 2016.

¹⁰⁵ “Dropbox Organization and Collected Memos Volume for Storms LENR Research Documentation Project”. Memo to Edmund Storms from Tom Grimshaw, July 10, 2016.

¹⁰⁶ “Storms LENR Research Development Project, Onsite Visit #8, July 31 to August 11, 2016: Summary of Activities and Accomplishments”. Memo to Edmund Storms from Tom Grimshaw, August 13, 2016.

¹⁰⁷ “Status Summary for the Storms LENR Research Documentation Project.” Memo to Edmund Storms from Tom Grimshaw, October 30, 2016.

Table A-2. Memos for Round 1, Onsite Visits #1 to #7

10 Publications

<u>Date</u>	<u>Subject</u>
9/16/15	Collection of Papers and Publications: Part 1
9/17/15	Collection of Papers and Publications: Part 2
9/19/15	Collection of Papers and Publications: Part 3
9/19/15	Collection of Papers and Publications: Part 4
9/20/15	Collection of Papers and Publications: Part 5
9/21/15	Collection of Papers and Publications: Part 6
9/21/15	Collection of Papers and Publications: Part 7
9/22/15	Collection of Papers and Publications: Part 8
9/22/15	Collection of Papers and Publications: Part 9
9/22/15	Collection of Papers and Publications: Part 10
9/23/15	Collection of Papers and Publications: Part 11
9/23/15	Collection of Papers and Publications: Part 12
9/23/15	Collection of Papers and Publications: Part 13
9/25/15	Collection of Papers and Publications: Part 14
9/26/15	Collection of Papers and Publications: Part 15
9/26/15	Collection of Papers and Publications: Part 16
9/26/15	Summary of Collection of LENR Papers and Other Items
11/29/15	Collection of LENR Papers and Other Items: Consolidated Files
3/4/16	Collected Works of Cold Fusion (LENR) Papers
4/24/16	Collected Works of Cold Fusion (LENR) Papers: Update

20 Unpublished Progress Reports

<u>Date</u>	<u>Subject</u>
2/11/16	Progress Reports in LENR Data File Collection
3/23/16	Progress Report Candidates Found in Data Files from LENR Experiments
3/31/16	Progress Reports and Related Documents in Files Received from ZIP Disks and CDs
5/21/16	Progress Reports and Related Documents in Two Datasets for the Storms LENR Research Documentation Project
5/28/16	Progress Reports and Related Documents in Two Datasets for the Storms LENR Research Documentation Project (Update)

30 Lab Notebooks (Work History)

<u>Date</u>	<u>Subject</u>
8/18/15	LENR Lab Notebook Inventory
1/18/16	LENR Work History (Table Refinements and Additions after Final Submittal)
2/19/16	Stage 1 Report: LENR Work History
4/20/16	LENR Work History (Lab Notebooks): Status Update with Photo and Audio Recordings

Table A-2. (Continued)

40 Electronic Data Files for Work History¹⁰⁸

<u>Date</u>	<u>Subject</u>
12/28/15	Inventory of Data Files Accompanying Work History
1/19/16	Detailed Inventory of Data Files from LENR Experiments
<u>Date</u>	<u>Subject</u>
11/19/15	Inventory of Files Received from ZIP and CD Disks
3/27/16	Detailed Inventory of Files Received from ZIP and CD Disks
3/31/16	Progress Reports and Related Materials in Files Received from ZIP Disks and CDs

50 Hard Copy Records

<u>Date</u>	<u>Subject</u>
9/6/15	Index for Hard-Copy Files
1/9/16	Scanning of Hard-Copy Files: Stage 1
2/19/16	Stage 1 Report for Hard Copy Files Stored in Tubs
4/21/16	Completion of Stage 1 Processing Hard Copy Files Stored in Tubs

60 Research Laboratory

<u>Date</u>	<u>Subject</u>
12/9/15	Description of LENR Laboratory Facilities, Santa Fe, NM As Of January 2015

60 LENR Library

<u>Date</u>	<u>Subject</u>
2/22/16	Stage 1 Summary: LENR Library Holdings
4/17/16	Inventory of Bookshelf Materials in Storms' Office

95 Interviews

<u>Date</u>	<u>Subject</u>
4/20/16	LENR Work History (Lab Notebooks): Status Update with Photo and Audio Recordings
7/9/2017	Transcriptions of March, 2016 (Round 1) Interviews

¹⁰⁸ Two sets of files (referred to as SF and ZC) were obtained from different sources. They are described in Section 2.4.

Table A-2. (Continued)

97 Project Management and Additional Topics

<u>Date</u>	<u>Subject</u>
6/10/15	Professional Biography Initiative
11/1/15	Storms LENR Documentation Project: Status and Next Steps
12/17/15	Storms LENR Documentation Project: Status and Next Steps
12/26/15	Summary of Meetings During December 19 to 23 Visit
2/1/16	Summary of Memos Describing Components of Storms LENR Research Documentation Project
2/13/16	Storms LENR Research Documentation: Status and Proposed Next Steps
5/30/16	Candidate Photos for Storms LENR Research Documentation Project
6/1/16	Summary of Memos Describing Components of Storms LENR Research Documentation Project (Update)

Table A-3. Memos for Round 2, Onsite Visit #8

40 Electronic Data Files

<u>Date</u>	<u>Subject</u>
9/25/15	Assuring Access to Electronic Files Generated in LENR Research: Not Yet Accomplished
10/22/16	Inventory of 3.5-Inch Floppy Disks Added to Project During Onsite Visit #8 (August 2016)
10/23/16	Inventory of CDs and DVDs Added During Onsite Visit #8 and from Storms' LENR Library
10/25/16	Location of ZC Folders and Files in Source Media: ZIP Disks and CDs
10/27/16	Preliminary Inventory of Folders and Files Stored on Your Current Computer as Provided on August 10, 2016
10/28/16	Folders and Files Stored on LaCie 8900 External Hard Drive: Preliminary Inventory

50 Hard Copy Records

<u>Date</u>	<u>Subject</u>
10/19/16	Hard Copy Files: Assignment of Dates and File Reorganization

60 Research Laboratory

<u>Date</u>	<u>Subject</u>
9/26/16	Electrolytic Cells and Calorimeters Used in LENR Research
12/20/16	Photographs of LENR Research Activities: Conferences and Meetings, Laboratories, and Electrolytic (and Related) Cells

80 Conferences

<u>Date</u>	<u>Subject</u>
12/20/16	Photographs of LENR Research Activities: Conferences and Meetings, Laboratories, and Electrolytic Cells

97 Project Management and Additional Topics

<u>Date</u>	<u>Subject</u>
7/10/16	Dropbox Organization and Collected Memos Volume for Storms LENR Research Documentation Project
7/27/16	Integrated LENR Research Timeline: Test Case
8/13/16	Storms LENR Research Development Project, Onsite Visit #8, July 31 to August 11, 2016: Summary of Activities and Accomplishments
10/30/16	Status Summary for the Storms LENR Research Documentation Project
12/17/16	Research at Los Alamos National Laboratory Prior to LENR Involvement

Table A-4. Memos for Round3, Onsite Visit #9

40 Electronic Data Files

<u>Date</u>	<u>Subject</u>
4/9/17	Additions to and Reorganization of Electronic Media in Project Storage Tubs
4/11/17	Tabulation of the Contents of CDs, DVDs, and VHS Tapes in Project Component CVD

50 Hard Copy Records

<u>Date</u>	<u>Subject</u>
4/1/17	Additional File Boxes for Hard Copy Files (Project Component HCF)

95 Interviews

<u>Date</u>	<u>Subject</u>
4/6/17	Detailed Interview Sessions During Onsite Visit #9
4/7/17	Trial Transcription of Interview Session #1 by Online Service, Rev.com

97 Project Management and Additional Topics

<u>Date</u>	<u>Subject</u>
3/13/2017	Inventory of Claytor Materials Related to Early Cold Fusion Research at Los Alamos National Laboratory
3/24/17	File Boxes for Pre-LENR Research at Los Alamos National Laboratory

Table A-5. Memos for Round 4, Onsite Visit #10

40 Electronic Data Files

<u>Date</u>	<u>Subject</u>
3/27/16	Detailed Inventory of Files Received from ZIP Disks and CDs ???
6/21/17	Printed Floppy Disk Files of Project Component 46FLD
8/16/17	Contents of and Electronic File Subcomponents: Printed Copy for Onsite Review
10/9/2017	Phases and Notes for Floppy Disk Files (Project Component 46FLD)

50 Hard Copy Records

<u>Date</u>	<u>Subject</u>
6/11/17	Additional File Boxes for Hard Copy Files (Project Component HCF)
6/25/17	Scanned Contents of Hard Copy Files, Tubs I-VII and A-F

95 Interviews

<u>Date</u>	<u>Subject</u>
6/13/17	Transcriptions of Interviews for the Phase 3 Report of the Storms LENR Research Documentation Project
8/22/17	Annotated Transcriptions of Three Rounds of Interviews (Round 1, Part 1 of 3)
8/22/17	Annotated Transcriptions of Three Rounds of Interviews (Round 2, Part 2 of 3)
8/22/17	Annotated Transcriptions of Three Rounds of Interviews (Round 3, Part 3 of 3)

97 Project Management and Additional Topics

<u>Date</u>	<u>Subject</u>
6/10/17	April 2016 Interviews: Transcripts (Claytor and Fowler)

Table A-6. Memos for Round 5, Onsite Visit #11

50 Hard Copy Records

<u>Date</u>	<u>Subject</u>
10/13/17	Hard Copy Files, Tubs I to VII and A to F: Assignment to Project Phases

97 Project Management and Additional Topics

<u>Date</u>	<u>Subject</u>
10/11/17	Collection of Project Memos for Rounds 1 to 5 of the Storms LENR Research Documentation Project

Appendix B. Publications Timeline

Appendix C. Unpublished Progress Reports Timeline

Appendix D. Work History Timeline

Appendix E. Electronic Data Files Timelines

E-1. Storms Computer Files (Round 1): 41SF1

E-2. Storms Computer Files (Round 2): 42SF2

E-3. ZIP and Round 1 CD Electronic Files: 43ZCD

E-4. Round 2 CDs, DVD Files and VHS Tape: 44CVD

E-5. External Hard Drive Files: 45EHD

E-6. 3–1/2 Inch Floppy Files: 46FLD

Appendix F. Hard Copy Records

F1. Hard Copy Records Timeline

F2. Scanned Contents of Hard Copy Files, Tubs I to VIII

F3. Scanned Contents of Hard Copy Files, Tubs A to F

Appendix G. LENR Library Timeline

Appendix H. Timelines of Other Components

H-1. ICCF Conferences

H-2. Dr. Storms' 2007 Book

Appendix I. Integrated Timeline

I-1 Integrated Timeline: Project Components (Except Work History)

I-2 Integrated Timeline: Work History

Annex I. Collected Works (Publications)

Annex II. Collected (Unpublished) Progress Reports

Annex III. Interviews of Dr. Storms (Annotated)

III-1. Round 1

III-2. Round 2

III-3. Round 3

Annex IV. Project Memos

Part 1. Onsite Visits 1 to 7, Components 10 to 30

Part 2. Onsite Visits 1 to 7, Components 40 to 97

Part 3. Onsite Visits 8 to 12