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WHAT DOES "K-25" STAND FOR?: DECIPHERING THE ORIGINS OF THE MANHATTAN PROJECT CODE NAMES IN OAK RIDGE

R. P. Prince and A. Milton Stanley*

In the popular lore of Oak Ridge, a lingering point of historical curiosity is the question of how the town's principal Manhattan Project-era plants came to be known by their code names of Y-12, X-10, K-25, and S-50. Over the past fifty years, a variety of theories have been put forward. It has been suggested that the plants were named after product codes, map coordinates, or simply random combinations of a letter and numbers. The uncertainty of finding an answer has been perpetuated in large part because official Manhattan Project histories have tended either to describe the code names as being chosen simply for "security reasons,"[1] or have made no mention at all of the subject.[2]

However, with World War II-period documentation recently brought together from collections at the East Tennessee Technology Park Inactive Records Center in Oak Ridge, a definitive answer for the origin of at least one of the plant names has been found.

The K-25 Plant began operation in January 1945 to enrich uranium for use in the first atomic bombs. This enrichment process involved separating the less fissionable isotope of uranium (U-238) from the rarer, more fissionable form (U-235) used in atomic weapons. The two isotopes were separated in a process known as gaseous diffusion using uranium hexafluoride (UF6) gas. The K-25 Plant, later renamed the Oak Ridge Gaseous Diffusion Plant, ceased weapons-grade enrichment in the 1960s. In 1985 all uranium enrichment activities were discontinued. Today the site, known as East Tennessee Technology Park (ETTP), is the focus of efforts to bring commercial industries to Department of Energy (DOE) lands in Oak Ridge. Yet despite changes in mission and official nomenclature, ETTP is still widely known in common parlance by its original name, K-25.

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[1]Vincent C. Jones, *Manhattan: The Army and the Atomic Bomb* (Washington, DC, 1985), 150, 178.

[2]See F. G. Gosling, *The Manhattan Project: Making the Atomic Bomb* (Washington, DC, 1999), Leslie R. Groves, *Now It Can be Told: The Story of the Manhattan Project* (New York, 1962), and Richard G. Hewlett and Oscar E. Anderson, Jr., *A History of the United States Atomic Energy Commission*, vol. 1, *The New World*, 1939 - 1946 (University Park, PA, 1962). None of these sources make mention of the code name origins.

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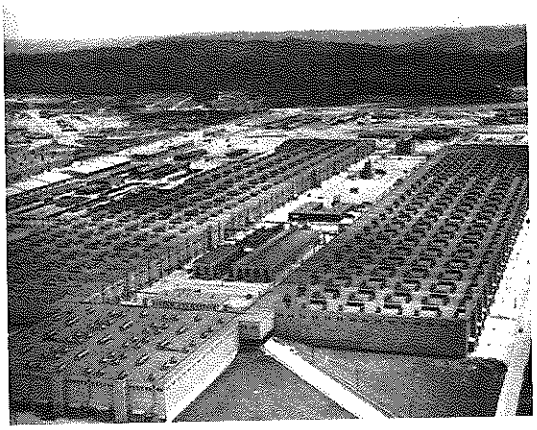
The most probable source for the code "K" is the first letter of the K-25 plant's design and development contractor: Kellex Corporation, a subsidiary of the M. W. Kellogg Company. Kellex was formed during World War II specifically to develop the first large-scale gaseous diffusion plant.[3] The name Kellex, in turn, is reportedly derived from the words "Kellogg" and "experimental."[4] Under this assumption, the term K-25 would be a shortening of "Kellex-25." A probable source for the origin of "25" can likewise be found in the early gaseous diffusion project literature, where it is well-documented that "25" was a World War II-period code for U-235, or enriched uranium.[5] A lesser-known code name for U-235 metal, "25 metal," has been found in the files of A. M. Squires, former director of theoretical engineering at Kellex.[6] These uses for the term "25" have both been linked in early Manhattan Project documentation to what later became known as the K-25 Plant.

However, even though "K" and "25" can be individually linked in Manhattan Project usage to the K-25 Plant, the uses of "K" and "25" as individual code designators still do not explain the combined code designator "K-25", or its relationship to the overall gaseous diffusion plant name. This lack of testimony or documentation for the meaning of "K-25" has hindered developing the certainty required for proving even the most plausible theories. Further reference documentation has been required. Recently that documentation has been found in early Manhattan Project records.



K-25 Plant. From Charles W. Johnson and Charles O. Jackson, *City Behind a Fence: Oak Ridge, Tennessee, 1942 - 1946.*

A combined (hyphenated) use of the code "K-25" is first found in a Kellex technical report of March 29, 1943. In this report, Clark E. Center, later K-25

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[3]*Completion Report on the K-25 Gas Diffusion Plant (U)*, vol. 1, December 20, 1945, East Tennessee Technology Park Inactive Records Center, Oak Ridge, TN (hereafter cited as ETTP Records), Kellex Corporation Files, no. K/Z - 594.

[4]M. I. Lundin, conversation with R. P. Prince, Oak Ridge, Tennessee, Spring, 1988.

[5]Lockheed Martin Energy Systems, Inc., *Glossary of Historical Terminology and Code Words Used in the Oak Ridge Gaseous Diffusion Plant, 1997*. ETTP Records, K/CG - 1157, 21.

[6]A. M. Squires Report, January 24, 1945, ETTP Records, Binder "Sep. Performance" (109) Case 1, Z - 1437.

plant superintendent, writes about a radioactive material called "K-25."[7] In the Kellex report, "K-25" seems to be used interchangeably with "U235 F6," an unmistakable reference to enriched uranium hexafluoride gas.[8] This early use of the term "K-25" therefore clearly identifies it with the product of the large-scale gaseous diffusion plant (U-235). This use of "K-25" in the March 1943 report indicates the term was already in use before the code-naming of the gaseous diffusion plant.

The earliest reference to "K-25" as a plant is found in the record of an April 1943 meeting of the so-called "Intergroup" for gaseous diffusion planning, in which the term "K-25 plant" appears twice.[9] This reference suggests that some time during the two weeks between the Center report (March 29, 1943) and Intergroup report (April 13, 1943) the term "K-25" came to be used at Kellex not only as a code for the gaseous diffusion plant's product, but for the plant itself.

April 13, 1943, was an important day for the K-25 Plant for another reason. That afternoon, a site selection meeting for the gaseous diffusion plant was held at the Manhattan office of Kellex Project Manager A. J. Baker.[10] By that time, the search for a location to build the large-scale gaseous diffusion plant had been narrowed to three sites: "Grand Coulee Big Bend," "Shasta (North Central California)," and "Clinton—T.V.A."[11] Included in the Kellex research and development director's journal entry for the site-selection meeting are listings of meeting attendees from Kellex, Carbide, Columbia University, and the Army Corps of Engineers, along with notes on site selection requirements and value rankings for each proposed site. However, there is no mention of the plant name or project name K-25, which presumably had been used earlier that morning at the second meeting of the Intergroup.[12]

The earliest references to the "K-25 plant" use a lowercase "p," indicating that "K-25" describes the type of plant rather than a proper facility name.[13] This usage of a lowercase "p" in the name "K-25" plant is found intermittently in the gaseous diffusion project literature as late as July 1945.

In the same way that a plant designed to produce asphalt is known as the "asphalt plant," one can reasonably speculate that the first plant designed to produce K-25 would have been known as the "K-25 plant." The same code used for

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[7]"The Diffusion Plant, First Progress Report," March 29, 1943, ETTP Records, A - 825, 181.

[8]Ibid., 182.

[9]J. H. Arnold Report, "Intergroup Meeting," April 13, 1943, ETTP Records, K/Z - 2817, 6.

[10]J. H. Arnold Report, "Journal of the Kellex Corporation research and development director, 1943," 4 vols., ETTP Records, K/Z - 7992, 2:66.

[11]Ibid.

[12]Arnold, "Journal," vol. 2.

[13]Arnold, "Intergroup Meeting," 6.

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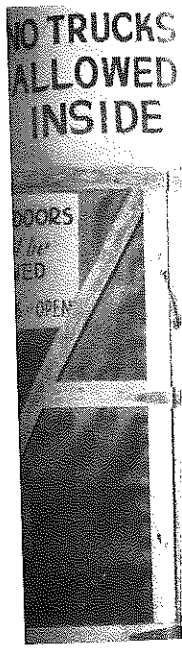

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[15]George O. Robinson,
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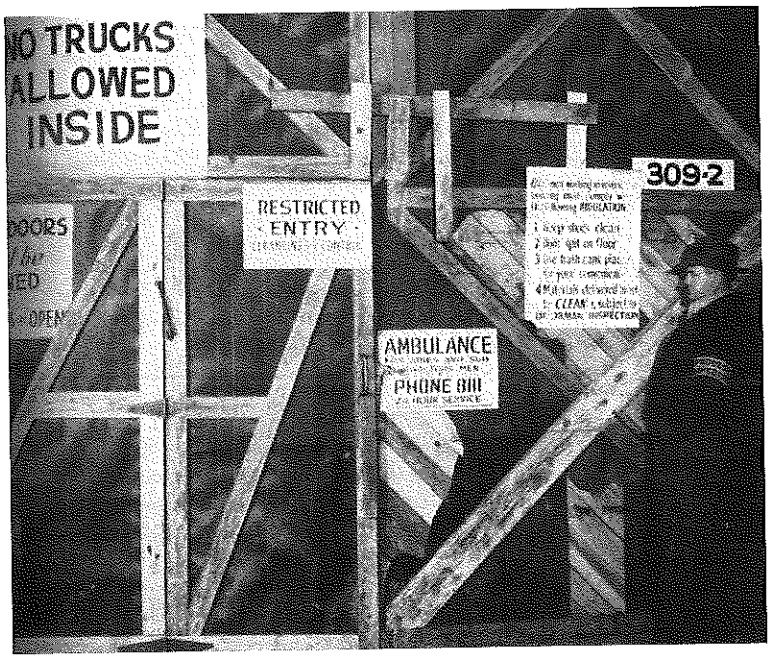
the plant, in turn, soon came to be used to describe the gaseous diffusion project as a whole. Thus the term "Project K-25," frequently seen in the post-April 1943 literature, took the place of Kellex's earlier designation of "Project X."[14] After April 1943, the phrases "large-scale gas diffusion plant," "large-scale plant," "large plant," and "Project X" seem to have been replaced with the terms "K-25 plant," "K-25," "Project K-25," and "K-25 Project."

It is interesting to note that this explanation for the origin of the term K-25 was first put forth more than fifty years ago by George O. Robinson in his book, *The Oak Ridge Story.*[15] Robinson's explanation, however, includes no source references and seems to have been, for the most part, overlooked in subsequent histories.[16]

After the large-scale gaseous diffusion plant was given the code name K-25 plant in early April 1943, the use of K-25 as a code designator for U-235 prod-



Security and secrecy have been consistent themes throughout most of the history of Oak Ridge. From Charles W. Johnson and Charles O. Jackson, *City Behind a Fence: Oak Ridge, Tennessee, 1942-1946.*

[14]"Kellogg Technical Data Book: Technical Data for Project X (U)," April 24, 1942, ETTP Records, K/Z - 7207.

[15]George O. Robinson, Jr., *The Oak Ridge Story: The Saga of a People Who Share in History* (Kingsport, TN, 1950), 92.

[16]Robinson's explanation is mentioned, however, in Charles W. Johnson and Charles O. Jackson, *City Behind a Fence: Oak Ridge, Tennessee, 1942 - 1946* (Knoxville, 1981).

uct material seems to have been discontinued, most likely for wartime security concerns of not associating too closely the terms for product and plant. After April 1943, there is increasing usage in project literature of other code designators for enriched uranium, most notably "tuballoy" or "T."

During the early years of the Cold War, the habits of project secrecy may explain the reluctance of the cognizant few to divulge the meaning of the name "K-25 plant" and to tacitly allow the popular mystery and speculation about the meanings of the Manhattan Project facility names to flourish.

Available information does not form a complete picture of the origin of other plant names in Oak Ridge. However, Manhattan Project-era records from DOE archives provide tantalizing evidence that suggests these other plants did not receive their names by completely random selection.

For example, the letter "Y" was used in the 1940s as a code for uranium. This usage suggests that the Y-12 Plant, created to enrich bomb-grade uranium by an electromagnetic process, also may have been named for its product. The evidence is not yet clear, however, on which came first, "Y" as plant name or as a product code.

Similar evidence exists for the X-10 site, now know as the Oak Ridge National Laboratory. In Manhattan Project parlance, "X" was a code for uranium metal, the fuel used for the original Graphite Reactor at X-10. But again, even assuming a relationship between plant name and uranium code, it is not clear which usage for "X" came first. Another possibility that is sometimes suggested for the use of "X" relates to the function of X-10's Graphite Reactor as a pilot plant for the Hanford reactor in Washington. According to this theory, "X" is a shortened form of "experimental."

No evidence at all for code name selection has been found for the S-50 Liquid Thermal Diffusion Plant, operated for thirteen months at the end of World War II as another process for uranium enrichment. The plant had limited success in enriching uranium, but the thermal diffusion process proved to be much less efficient than the gaseous diffusion or electromagnetic processes. Although the plant at one time employed hundreds of workers, all remaining DOE records in Oak Ridge are now contained in only thirteen storage boxes. Among the few remaining records are documents detailing which records were burned after the plant's shutdown in September 1945.

Efforts to arrive at complete answers for the origins of Manhattan Project-era plant names are limited by several factors inherent in DOE operations. First, while much of the earliest Manhattan Project information is now publicly available, many records that may shed light on the question remain classified. It is also possible that persons with knowledge of how these plants got their names are still holding to half-century-old vows of secrecy, even after the protected information has long since been declassified. If so, it is still possible that they will someday step forward and shed further light on the origins of the Manhattan Project code names in Oak Ridge.

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