

**NUCLEAR GRAVITATION  
FIELD THEORY AUTHOR**

**KENNETH F. WRIGHT (KEN)  
BACKGROUND**



# **Nuclear Gravitation Field Theory Author**

## **Kenneth F. Wright (Ken) Background**

### **EDUCATION**

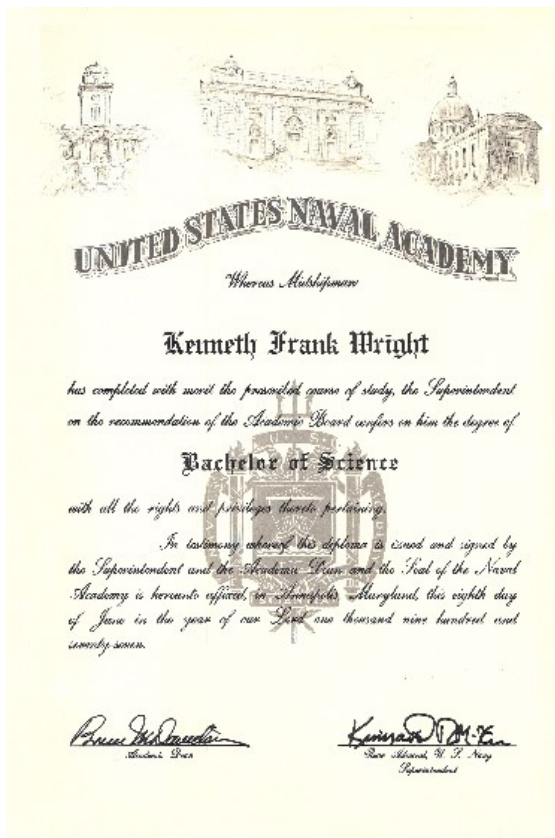
I was appointed to the United States Naval Academy on July 23, 1973, to begin my Plebe Summer training. The Plebe Indoctrination Program is implemented during Plebe Summer to the new Midshipmen 4<sup>th</sup> Class (Plebes) in like manner to Boot Camp for enlisted military inductees. The Plebe Indoctrination Program continuously applies both physical and mental pressure to determine if the new Midshipmen will be able to handle the rigors of “the heat of battle” a military officer may experience in the future. The Plebe Indoctrination Program continues for the 4<sup>th</sup> Class Midshipmen during their entire first academic year at USNA. Courses for the 4<sup>th</sup> Class Midshipman academic year include Chemistry, Calculus, Introduction to Naval Science, Introduction to Naval Engineering, and History of Sea Power.

Midshipman 3<sup>rd</sup> Class “Summer Cruise” involves assigning the 3<sup>rd</sup> Class Midshipmen to U.S. Navy Warships to work and stand at sea watches as Enlisted crew members. When Midshipmen graduate from USNA, they will become Commissioned Officers and be assigned to a division with Enlisted personnel working for them. Midshipman 2<sup>nd</sup> Class Summer introduces the 2<sup>nd</sup> Class Midshipmen to their career options after graduation from USNA: Navy Pilot or Naval Flight Officer at Pensacola, Florida; U.S. Marine Corps Officer at Quantico, Virginia; Submarine Service at Groton, Connecticut; and Surface Warfare Service (Surface Warships) at Newport, Rhode Island (these were the locations I visited during the Summer of 1975 – the locations may be different today for USNA Midshipmen). Midshipman 1<sup>st</sup> Class “Summer Cruise” assigns the 1<sup>st</sup> Class Midshipmen to a U.S. Navy Warship (Surface Ship or Submarine) to “shadow” a Division Officer assigned to the ship and work and stand at sea watches as a Division Officer.

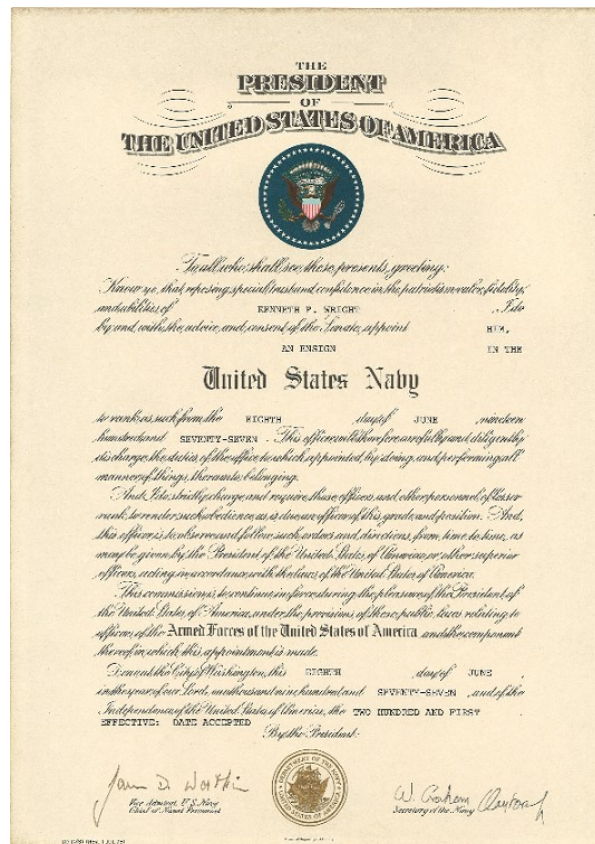
The Majors Program begins during the 3<sup>rd</sup> Class Midshipman academic year and Majors are selected during the second semester of 4<sup>th</sup> Class Midshipman academic year. All Midshipmen major in Naval Engineering to prepare them to be Naval Officers assigned to a U.S. Navy Warship. The Majors Program allows a Midshipman to focus on specific areas of study. 80% of the Midshipmen must select an Engineering or Technical Major. I selected Physics as my

major. Required courses for 3<sup>rd</sup> Class Midshipman academic year include Naval Ship Design and Navigation – Piloting and Celestial. Required Courses for 2<sup>nd</sup> Class Midshipman academic year include Applied Thermodynamics - Steam Plant Design and Electrical Engineering as applicable to a U.S. Navy Warship. Required Courses for 1<sup>st</sup> Class Midshipman academic year include Naval Weapons Systems and Leadership. Courses required for the Physics Major include Differential Equations, Advanced Engineering Mathematics, Physical Mechanics I and II, Electricity and Magnetism I and II, Thermal Physics, and Physics of the Atom I and II (Quantum Physics). To complete the required course hours for the Physics Major, one could select from a list of elective courses. I completed my Physics Major with Nuclear Physics and Solid State Physics. I also completed Reactor Physics I and II to learn the design and operation of a Nuclear Fission Reactor and prepare for Submarine duty.

I completed the 4-year program and obtained a Bachelor of Science Degree from the United States Naval Academy in Annapolis, Maryland, on June 8, 1977. Upon receiving my degree, I obtained a Commission as an Ensign in the United States Navy.



**USNA Bachelor of Science Degree**



**Commissioning as US Naval Officer**



*KENNETH FRANK WRIGHT  
"KEN"*

After leaving his hometown of Milwaukee, Wisconsin, Ken, alias Rocket "flew" to USNA with hopes of becoming the world's first nuclear qualified interstellar astronaut. Actually, his zeal and explosive approach to situations deemed him the nickname "Rocket." Aside from his love for music and weekend liberty, Ken's only love is Adm Rickover's Nuclear Power Program. Ken will always be remembered for his energy, intelligence, and leadership by example that won him the respect of all those who worked for him. Ken will leave Mother B for the sunny skies of Orlando, Florida, where he will attend Nuclear Power School to prepare him for submarine duty.

**Midshipman Kenneth Frank Wright  
United States Naval Academy Class of 1977 Yearbook Entry**



**United States Naval Academy Logo**



**USNA Class of 1977 Class Crest**



**United States Naval Academy Main Gate**



**United States Naval Academy**

Upon Commission as an Officer in the United States Navy, I continued the education required to prepare me for service in the United States Nuclear Navy Submarine Fleet. I attended and successfully completed the following schools:

- U.S. Naval Nuclear Power School in Orlando Florida, from September 1977 to March 1978 - Class 7709.

Naval Nuclear Power School is a six-month intense curriculum of applied mathematics, chemistry, thermodynamics, mechanical engineering, electrical engineering, and pressurized water reactor theory, design, and operation of a Naval Nuclear Propulsion Plant.

- U.S Naval Nuclear Propulsion Prototype Training Unit training at the Naval Reactors Facility on the Idaho National Engineering Laboratory Site about 60 miles west of Idaho Falls, Idaho, from April 1978 to September 1978 - Class 7709.

Naval Nuclear Prototype Training is a six-month intense training on an operating reactor plant with similar design to those on Nuclear Powered Surface Ships and Submarines. I qualified as an Engineering Officer of the Watch (EOOW) on the S1W Reactor Plant Prototype for the First Nuclear Fast Attack Submarine - U.S.S. Nautilus (SSN-571).



**United States Naval Nuclear Power School  
Orlando, Florida**



**Naval Nuclear Prototype Training Unit  
Naval Reactors Facility  
Idaho National Engineering Laboratory**

- U.S. Naval Submarine Officer Basic Course at the Naval Submarine Base, Groton, Connecticut, from October 1978 to January 1979.  
Submarine Officer Basic Course is three-months of training to introduce the student to submarine underway operations and the non-nuclear systems supporting those operations.



**United States Naval Submarine Base  
Groton, Connecticut**



Several years later after leaving the U.S. Navy while employed by Southern California Edison at the San Onofre Nuclear Generating Station I had the opportunity to further my education. I attended the University of Phoenix in San Diego, California, from January 1998 to December 2000, and obtained a Master of Science Degree in Computer Information Systems – essentially a Master of Science Degree in Business Administration with emphasis in Computer Science.



**University of Phoenix – San Diego, California**

## **WORK HISTORY**

I served as a Naval Officer assigned to United States Navy Nuclear Fast Attack Submarine U.S.S. Flasher (SSN-613) home ported in San Diego, California, from January 1979 through June 1982. During my sea tour aboard U.S.S. Flasher (SSN-613), I served as the Electrical Officer, the Communications and Electronic Materials Officer, the Main Propulsion Assistant to the Engineer Officer, and Assistant Operations Officer. I began my tour aboard U.S.S. Flasher at the rank of Ensign United States Navy (O-1) and completed my tour aboard U.S.S. Flasher at the rank of Lieutenant United States Navy (O-3).

From November 1979 to June 1980, I participated in my first Western Pacific Deployment aboard U.S.S. Flasher. I became a Member of the Realm of the Golden Dragon when U.S.S. Flasher, steaming westbound, crossed the 180<sup>th</sup> Meridian (180° West or East), also known as the International Date Line. When one crosses the International Date Line heading west, clocks are moved ahead 24 hours or one day.



### Domain of the Golden Dragon Certificate

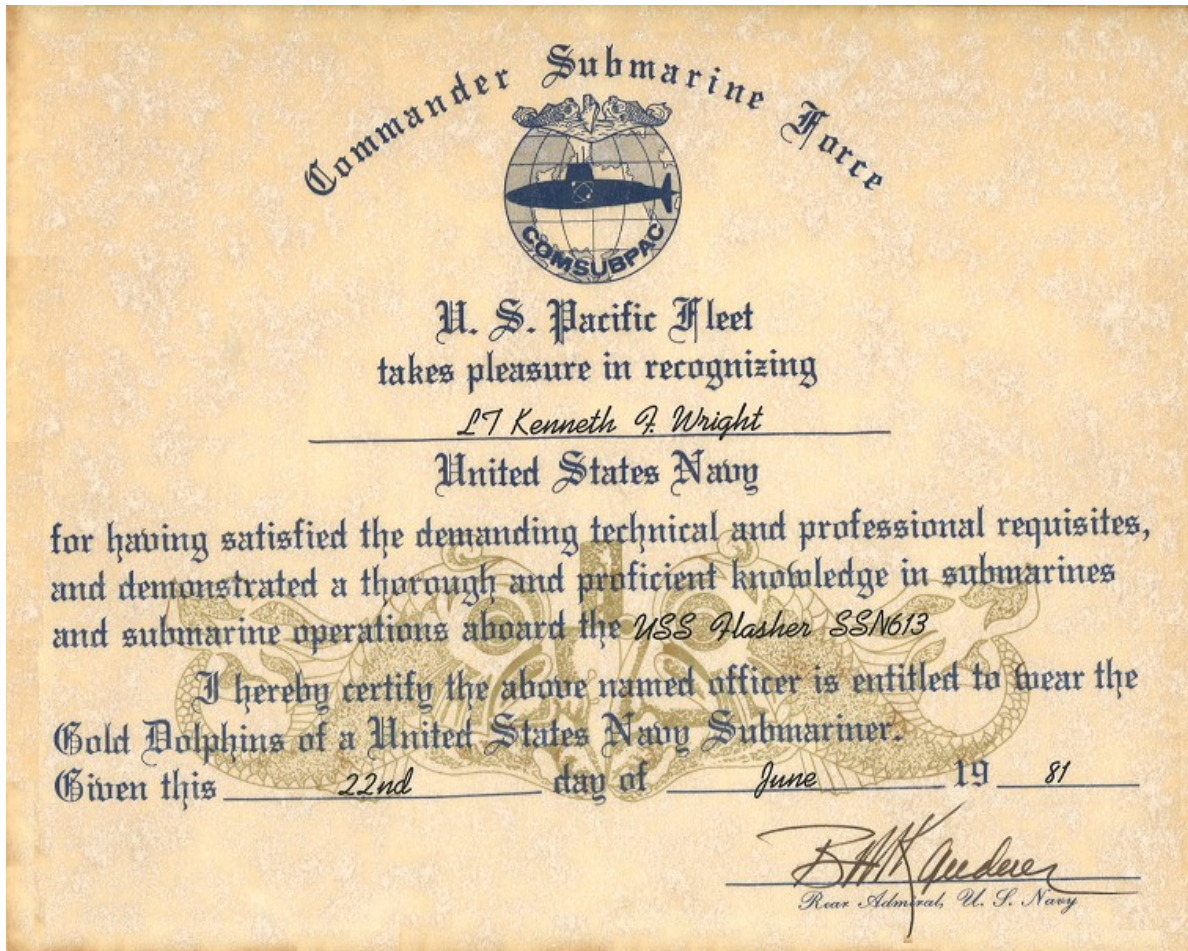
During the first half of the deployment, U.S.S. Flasher was originally scheduled to make a port call at Sattahip, Thailand, for Christmas 1979. However, due to the Iranian government taking hostage the United States Citizens working at the U.S. Embassy in Tehran, Iran, U.S.S. Flasher was re-directed to steam to the Indian Ocean to monitor shipping activity near the Strait of Hormuz. The trip to the Indian Ocean required U.S.S. Flasher to cross the Earth's Equator, in the vicinity of the East Indies. Since I had never previously crossed the Equator heading south on a U.S Navy ship, I was considered a greasy, grimy, polliwog. I participated in the Shellback initiation ceremony (much like a college freshman going through an initiation to become a member of a college fraternity) and became a Certified Shellback.



## Shellback Certificate

The second half of the deployment, U.S.S. Flasher participated in operations in the Western Pacific Ocean. Specific details of submarine operations performed during the deployment were highly classified. During this deployment, U.S.S. Flasher made port calls to Pearl Harbor, Hawaii; Guam; Subic Bay, Philippines; Yokosuka, Japan; and Pusan, South Korea.

In June 1981 I completed all the requirements for Qualification in Submarines giving me the right to wear the Gold Dolphins with honor and become a member of a very elite group of people. For a Naval Officer to “Qualify in Submarines” one is required to qualify as Engineering Officer of the Watch (EOOW) on the Submarine Nuclear Propulsion Plant, qualify as Diving Officer of the Watch (DOOW), and qualify as Officer of the Deck (OOD) Surfaced and Submerged.

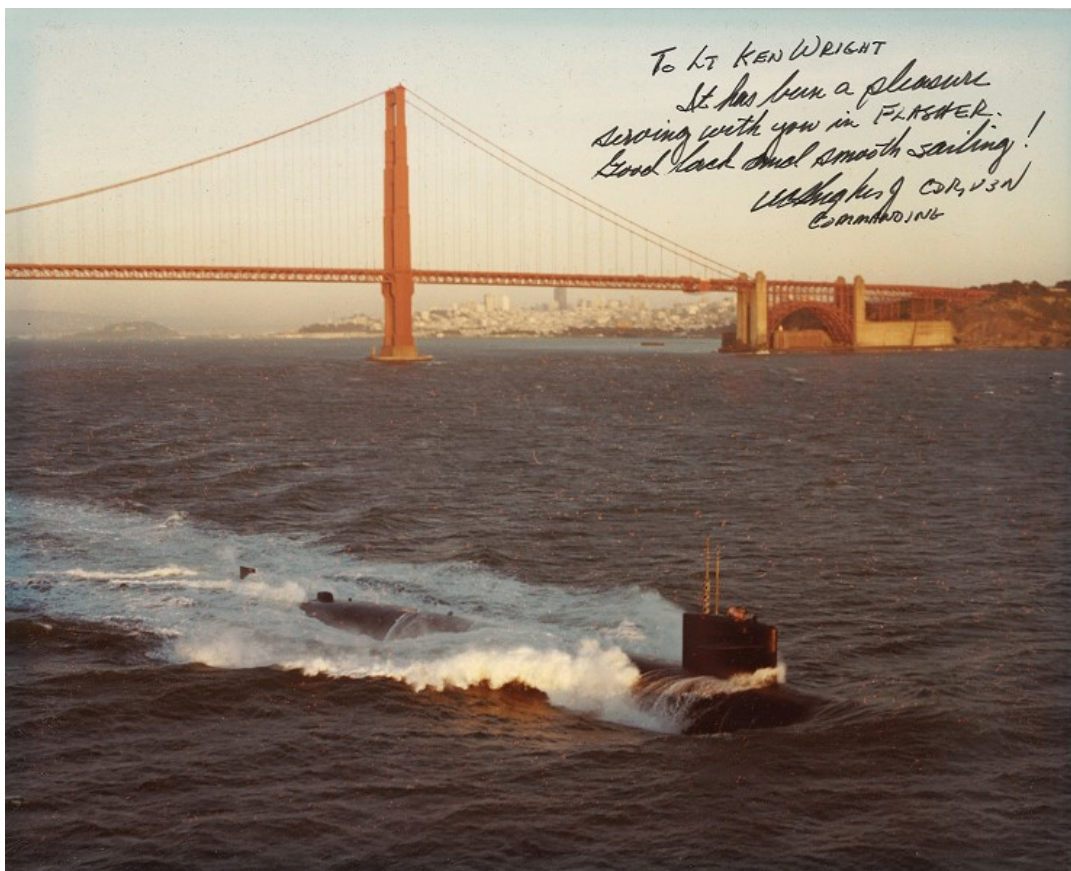


### U.S. Naval Officer Qualification in Submarines

From July 1981 to January 1982, I participated in my second Western Pacific Deployment aboard U.S.S. Flasher. During the first half of that deployment, U.S.S. Flasher returned to the Indian Ocean to support Naval operations near the Strait of Hormuz. During the second half of the deployment, U.S.S. Flasher participated in operations in the Western Pacific Ocean. As noted for the previous Western Pacific deployment, specific details of submarine operations

during the deployment were highly classified. During this deployment, U.S.S. Flasher made port calls in Rockingham, Australia (near Perth); Guam; Subic Bay, Philippines; and Yokosuka, Japan.

Upon completion of my obligated service to the United States Navy, I completed my tour aboard U.S.S. Flasher and resigned my Active Duty Commission as a Naval Officer. The Commanding Officer of U.S.S. Flasher, W.C.(Bill) Hughes, Jr, Commander United States Navy (O-5), bid me farewell with a signed photograph of U.S.S. Flasher (SSN-613) steaming westward from San Francisco, California, Harbor just outside the Golden Gate Bridge.

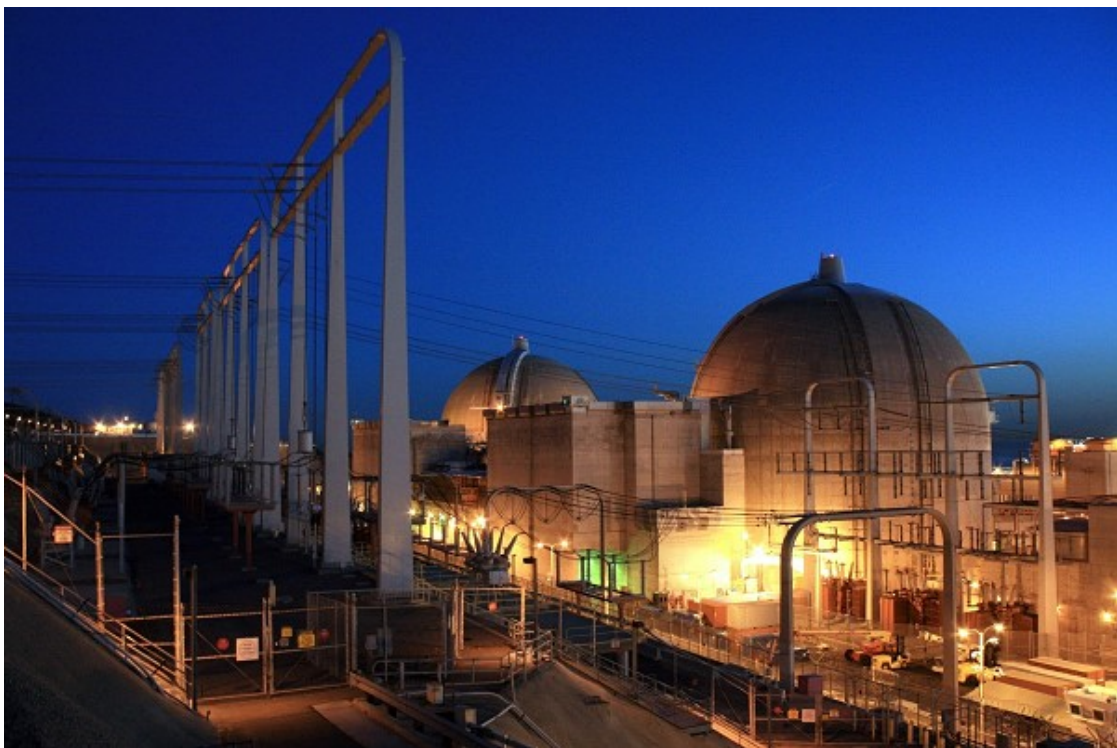


**U.S.S. Flasher (SSN-613)  
Nuclear Powered Fast Attack Submarine**

I officially completed my active duty commitment on June 30, 1982, and I was honorably discharged from the United States Navy.



On July 19, 1982, I began my civilian career in the Commercial Nuclear Industry. I was hired by Southern California Edison to fill one of several available positions as Shift Technical Advisor (STA) at San Onofre Nuclear Generating Station (SONGS). The STA position was required to be stationed at all U.S. Commercial Nuclear Units when operating by Federal Regulations in response to lessons learned from the Three Mile Island Unit 2 Reactor Accident that occurred on March 28, 1979. STAs are required to have at least a Bachelor of Science Degree in an Engineering Discipline or a Science such as Physics or Chemistry. STA positions were needed to be filled at SONGS Unit 1 and at SONGS Units 2 and 3. SONGS Unit 1 was a Westinghouse 3-Loop Pressurized Water Reactor. SONGS Unit 2 and Unit 3 were each a Combustion Engineering 2-Loop Pressurized Water Reactor with a Common Control Room. I was placed into a licensing program to earn my Senior Reactor Operator (SRO) License on SONGS Units 2 and 3. I successfully completed the comprehensive licensing examination process which included a 6-hour written examination, a simulator examination, and a plant walk-through oral examination with a United States Nuclear Regulatory Commission (U.S. NRC) examiner. The U.S. NRC issued my SONGS Units 2 and 3 SRO License on January 9, 1984.



**San Onofre Nuclear Generating Station Units 2 and 3**



**The United States  
Nuclear Regulatory Commission**

**Nuclear Plant  
Senior Reactor Operator  
License Certification**

granted to

**Kenneth F. Wright**

effective on the ninth day of January, Nineteen  
Hundred and Eighty-Four, for having met the provisions of  
the U.S. Nuclear Regulatory Commission's regulations and  
having demonstrated the knowledge, skills, and ability to carry  
out the responsibilities of the position of Senior Reactor  
Operator at the  
**San Onofre Nuclear Generating Station, Units 2 and 3**  
**Facility Docket Nos. 50-361 and 50-362**

In accordance with the terms and conditions of  
Senior Operator License Number 50056  
Operator Docket Number 55-50062

Handwritten signature of Nuccio Palladino in cursive.

Chairman

Handwritten signature of Harold Benton in cursive.

Director,  
Office of Nuclear Reactor Regulation

Handwritten signature of the Regional Administrator in cursive.

Regional Administrator,  
Region V

**Kenneth F. Wright**  
**Senior Reactor Operator License Certification**  
**San Onofre Nuclear Generating Station Units 2 and 3**





**San Onofre Nuclear Generating Station Units 1, 2, and 3**



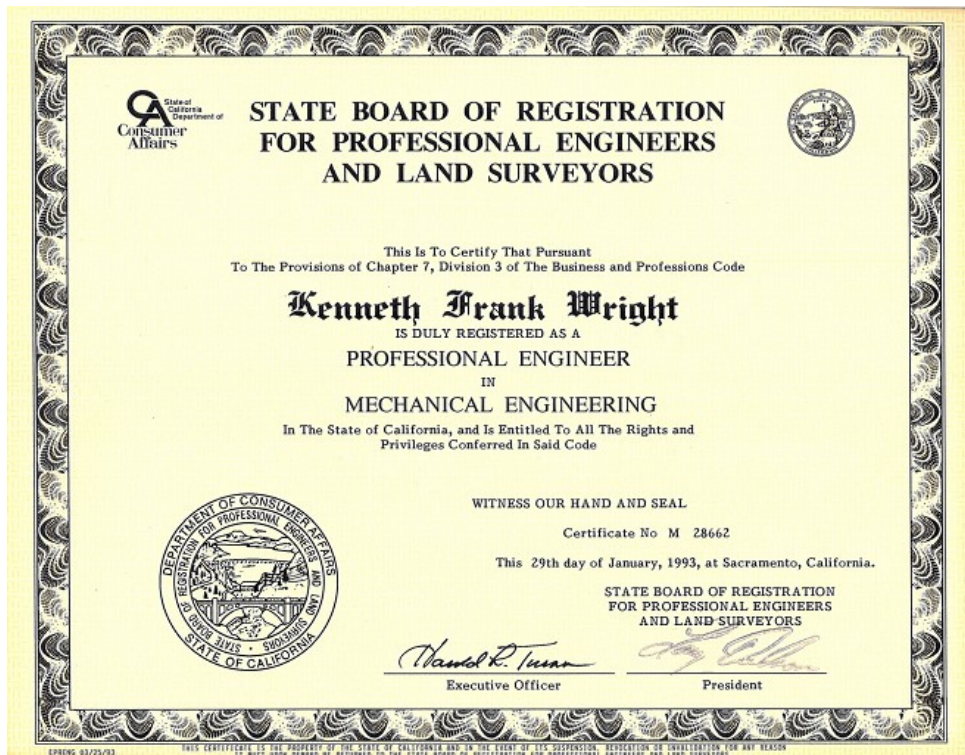
**San Onofre Nuclear Generating Station Units 2 and 3 and Pacific Ocean**

During my 30 1/2 years of employment with Southern California Edison from July 19, 1982, to December 14, 2012, at SONGS, I held several positions. After I obtained my SRO License on SONGS Units 2 and 3, I stood 24-Hour Duty Days as STA at SONGS Units 2 and 3. I worked as a Station System Cognizant Engineer responsible for several systems, one system at a time, for all three San Onofre Nuclear Units. I worked as a Nuclear Engineering Design Organization Integrated Plant Review Engineer where I reviewed the design changes for all three San Onofre Nuclear Units to ensure compliance with all engineering design codes and applicable Title 10 Code of Federal Regulations Chapter 50 (10CFR50) regulatory requirements. I completed my last 13 years at SONGS as an Engineering Training Instructor where I taught several engineering classes to new hire engineers, provided continuing training for station engineers, provided initial and continuing training for Emergency Response Organization (ERO) Personnel on Emergency Plan Implementing Procedures (EPIPs) and Severe Accident Management Guidelines (SAMGs), and provided some initial and continuing training for SONGS Units 2 and 3 Operations Department personnel.



**Kenneth Frank Wright**  
**California Professional Engineer License – Nuclear Engineering**

While employed by Southern California Edison at SONGS, I obtained Registration as a Professional Engineer in both the Nuclear and Mechanical Engineering Disciplines with the State of California. I successfully completed the California Board of Professional Engineers Nuclear Engineer 8-hour written examination in October 1985 and was issued the Professional Engineer License in Nuclear Engineering on February 21, 1986. I successfully completed the California Board of Professional Engineers Mechanical Engineer 8-hour written examination in October 1992 and was issued the Professional Engineer License in Mechanical Engineering on January 29, 1993.



## **Kenneth Frank Wright California Professional Engineer License – Mechanical Engineering**

SONGS Unit 1 was permanently shut down in December 1992 in response to a final legal agreement between the California Public Utilities Commission (CPUC) and Southern California Edison due to concern about the SONGS Unit 1 Steam Generator Stainless Steel U-Tube integrity and determine whether or not replacing the SONGS Unit 1 Steam Generators was cost effective for the rate payers.

In 2010 for SONGS Unit 2 and in 2011 for SONGS Unit 3, the original Inconel-600 U-Tube Steam Generators were replaced with new design Inconel-690 U-Tube Steam Generators manufactured by Mitsubishi Heavy Industries of Japan. The Inconel-600 U-Tubes in each original Steam Generator developed leaks one at a time during the 30-year period of operation of each unit and each tube was plugged once identified as a leaker during that period. After 30 years of operation, each Steam Generator had between 5% and 10% of their tubes plugged. The Inconel-600 U-Tubes are susceptible to Stress Corrosion Cracking at elevated temperatures with differential pressure across the tubes which is the normal condition present during power operations. Tube plugging isolates the tube leaks and prevents the Primary System Reactor Coolant from transferring potentially radioactive water into the clean Main Steam System. The Main Steam System provides the steam to drive the Main Turbines. The Main Turbines drive the Main Electrical Generators for each unit to provide electrical power to the Western United States electrical distribution grid. The reduction of available Steam Generator tubes for heat transfer from the Reactor Coolant System to the Main Steam System reduces the thermal efficiency of the Steam Cycle, therefore, reduces the maximum possible Main Generator electrical power output. The degradation of the heat transfer capability of the original Steam Generators led to the Southern California Edison senior management decision to replace the SONGS Unit 2 and Unit 3 Steam Generators.

Halfway through the first operating cycle for Unit 3 with the replacement Steam Generators installed, a Steam Generator tube leak occurred on SONGS Unit 3 Steam Generator #2. SONGS Unit 3 was shut down in early 2012 to determine the cause of the tube leak. During that time, SONGS Unit 2 was in the middle of a refueling outage after completing its first operating cycle with the replacement Steam Generators. The tube leak root cause was determined to be a design flaw in the Steam Generator U-Tube support structure leading to a “flow elastic instability” condition of the U-Tubes at high power levels. The “flow elastic instability” causes tubes in the U-bend region of the tubes in the upper portion of the Steam Generator to rub against each other wearing away the tube walls until the tube integrity fails and a Primary-to-Secondary Leak occurs. SONGS Unit 2 never started up again after that refueling outage even though half of the reactor core contained new fuel and the unit was ready to operate for another fuel cycle.

Although the design issue could have been corrected in each Steam Generator, U.S. Senators from California Diane Feinstein and Barbara Boxer pressured the U.S. NRC to force a permanent

shut down of SONGS Unit 2 and Unit 3. The U.S. NRC and Southern California Edison senior management battled back and forth for several months between 2012 and 2013 regarding permitting continued full power operation of SONGS Units 2 and 3. In the end, Southern California Edison senior management decided to permanently shut down both units in May 2013. Meanwhile in 2012, Southern California Edison implemented a reduction in work force plan to reduce the personnel staffing at SONGS from about 2,200 to less than 1,500. I took a voluntary early retirement from Southern California Edison on December 14, 2012, in response to the planned SONGS reduction of work force.

From January 2014 through March 2014, I was employed by Randstad Engineering as a contract Nuclear Maintenance Training Instructor at the South Texas Project Nuclear Electric Generating Station (STP NGS) near Wadsworth, Texas. STP NGS is a two-unit site, each unit is a Westinghouse 4-Loop Pressurized Water Reactor. I trained contract maintenance personnel coming to STP NGS to support an upcoming refueling outage.



**South Texas Project Nuclear Electric Generating Station – Wadsworth, Texas**

From April 2014 through March 2016, I was employed by Gilbert Consulting Services, Incorporated, as a contract Nuclear Engineering Training Instructor at the Duke Energy Corporate Office in Charlotte, North Carolina. I supported the Duke Energy - Progress Energy Corporate Merger by unifying the two Nuclear Fleets in three process areas - Emergency Response Organization Programs, Engineering Program Management, and Engineering Qualification Requirements. I taught classes on the new processes and procedures associated with those programs at the Duke Energy Corporate Office and at each of the six operating Duke Energy Nuclear Sites.



**Duke Energy Corporate Offices Including Duke Energy Building in Uptown  
Charlotte, North Carolina**



**Duke Energy Building at Night – Celebrating Independence Day  
Charlotte, North Carolina**

The six Duke Energy operating Nuclear Sites are as follows:

1. Brunswick Nuclear Plant: A two-unit site, each is a General Electric Boiling Water Reactor
2. Catawba Nuclear Station: A two-unit site, each is a Westinghouse 4-Loop Pressurized Water Reactor
3. H. B. Robinson Nuclear Plant: A single unit site with a Westinghouse 3-Loop Pressurized Water Reactor
4. McGuire Nuclear Station: A two-unit site, each is a Westinghouse 4-Loop Pressurized Water Reactor
5. Oconee Nuclear Station: A three-unit site, each is a Babcock and Wilcox 2-Loop Once-Through Steam Generator Pressurized Water Reactor
6. Shearon-Harris Nuclear Plant - A single unit site with a Westinghouse 3-Loop Pressurized Water Reactor



**Brunswick Nuclear Plant – Southport, North Carolina**



**Catawba Nuclear Station – York, South Carolina**





**H. B. Robinson Nuclear Plant – Hartsville, South Carolina**



**McGuire Nuclear Station – Huntersville, North Carolina**



**Oconee Nuclear Station – Seneca, South Carolina**



**Shearon-Harris Nuclear Plant – New Hill, North Carolina**

From February 2017 through June 2017, I was employed by Gilbert Consulting Services, Incorporated, as a contract Nuclear Engineering Training Instructor at DTE Energy's Enrico Fermi Nuclear Plant near Newport, Michigan. Enrico Fermi Nuclear Plant is a single unit site with a General Electric Boiling Water Reactor. I updated various Engineering Training Lesson Plans to prepare for an upcoming Institute of Nuclear Operations (INPO) Accreditation Team Visit (ATV) at Fermi. Click on the image, below, to see a larger photograph of the DTE Energy Enrico Fermi Nuclear Plant.



**Enrico Fermi Nuclear Plant – Newport, Michigan**

I was employed by EGS (Empowered Global Solutions), Incorporated, as a Senior Nuclear Training Specialist at the Department of Energy Savannah River Site from October 2, 2017 through December 13, 2018. I developed and implemented Continuing Training and provided Initial Training for Liquid Waste Operations personnel at the Savannah River Site. The Savannah River Site Training Facility is located in the H Area of the Savannah River Site.



**Savannah River Site Jackson Security Entrance Gate**



**Savannah River Site – H Area  
United States Department of Energy Savannah River Site  
Aiken, South Carolina**

I am currently employed with Duke Energy as a Nuclear Station Instructor Engineering at the Duke Energy Generation Support Center in Kings Mountain, North Carolina. I began my employment with Duke Energy on September 9, 2019. I primarily develop and implement Initial Training and Continuing Training for Duke Energy Nuclear Fleet Engineering personnel. I also provide support for Maintenance Training and Operations Training for the Duke Energy Nuclear Fleet. The Duke Energy Nuclear Fleet includes the Brunswick Nuclear Plant in Southport, North Carolina; the Catawba Nuclear Station in York, South Carolina; the H.B. Robinson Nuclear Plant in Hartsville, South Carolina; the McGuire Nuclear Station in Huntersville, North Carolina; the Oconee Nuclear Station in Seneca, South Carolina; and the Shearon-Harris Nuclear Plant in New Hill, North Carolina. Photos of those specific Nuclear Sites are provided above in my previous discussion of my position as a Contract Nuclear Engineering Training Instructor for Gilbert Consulting Services, Inc., supporting the Duke Energy / Progress Energy Merger in 2014 to 2016.



**Duke Energy Generation Support Facility  
Kings Mountain. North Carolina**