CURRICULUM VITAE

Mr. Shivanand C. Swamy Pharalamath **M.Sc. CSIR-UGC NET (JRF) & Former S.O.C. @NFC**
Former Forest Officer, Karnataka Forest Department,
Govt.of Karnataka
S/o: Dr.Chanamallayya S.Pharalamath Somawar Peth Near
Shankarling Tepmle Banahatti TQ:Jamkhandi
Dist:Bagalkote Karnataka W.No-09, H.No-1041

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PERSONAL PARTICULARS:

Name	**: Mr.** Shivanand C. SwamyPharalamath
Father's name	**:** Dr. Chanamallayya S.SwamyPharalamath
Mother's name	: Mrs.Mahadevi C. SwamyPharalamath
Sex	**:** Male
Date of Birth	**:** 15th Dec. 1993
Nationality	**:** Indian
Mother Tongue	**:** Kannada
Languages Known	**:** Kannada, English and Hindi
Hobbies and Talents	**:** Giving Seminars, Speech, Writing Scientific Articles, Songs and Short Stories

PERSONAL APPRAISAL :

Dedicated and Hardworking

Pleasing manner and well behaved

Good communication and interpersonal skills

Quick adaptation to the challenging environment

EDUCATIONAL QUALIFICATION:

Sl no	**Name of course**	**School/college/university**	**Year of Passing**	**Percentage**
1	M.Sc. (Physics, Nuclear and Particle Physics Specialisation), Qualified CSIR-UGC NET (JRF) with AIR-275	Basaveshwar Science College and Prof. C.N.R.Rao Research Centre, Bagalkote. Affiliated to Rani Channamma University, Belagavi	2013-2015	C.G.P.A. 8.45 got the First rank to the University with Gold Medal and cash award
2	B.Sc. (P.C.M.)	B.L.D.E.A's B.H.S. Arts, Comm. and T.G.P. Science College, Jamakhandi	2010-2013	Distinction with gold medals
3	P.U.C. (P.C.M.B.)	S.R.A. Composite Junior College, Banahatti	2008-2010	Distinction with Phy-100 M-100 C.E.T. Med-3101 and Eng-16021
4	S.S.L.C.	Govt. Kannada Medium Secondary School, Banahatti	2008	Distinction with Kannada-124

SCHOLASHIPS OBTAINED:

- **Sir C.V.Raman scholarship for Three Year (B.Sc.)**
- **Somaiya Vidya Vihar Godavari Bio-refinaries,Sameerwadi (from SSLC to M.Sc.)**
- **Got Protsaha Dhana by Advocate General Shri Girisagar, Jamakhandi.**
- **Dr.B.M.Kalashetti Mother's Memorial Scholarship for B.Sc.**
- **B.L.D.E.A's Old Student Associa'tion Jamakhandi for two year.**
- **Govt. of Karnataka Department of Science & Technology for two year (M.Sc.)**
- **Karepass Govt. of Karnataka (Vidyasiri Scholarship) for two year (M.Sc.)**
- **Shri Jagadish Gudagunti,Managing Director Prabhulingeshwar sugar's factory and Bio-Refinaries, Siddapur, Jamakhandi; Sponsored for IAS coaching, NEW DELHI**

PROJECT:

"Junction Diode As a Radiation Detector" under the guidance of **Mrs.Pratibha C.Kanavi. Assistant professor and staff incharge of** P.G. Department of Physics,

TECHNICAL SKILLS :

Operating System with Basic Computer Knowledge MS-XL, MS-PP

PERSONAL SKILLS

- Hard and Knack work towards success
- Good inter personal skills
- Initiative and Drive for success and Perseverance
- Ability to work in a team
- Strong analytical skill with problem solving capability

Exams Passed:

- Selected as an Accounting Officer, Taluk Panchayat, Sindagi
- Selected as a Panchayat Development Officer and Gram Panchayati Secretary Gr. 1
- Selected as a Scientific Officer "C" @NFC (Nuclear Fuel Complex, Hyderabad) Govt. of India (An ISO 9001, 14001 and 45001 Organization)
- Selected as a Forest Range Officer, Karnataka Forest Dept. Govt. of Karnataka
- Cleared CSIR-UGC NET (JRF) -2020 June in Physical Sciences (Physics)

Work experience in teaching realm: 03 Years

- worked as a Scientific Officer "C" @NFC (Nuclear Fuel Complex, Hyderabad) Govt. of India
- worked as a Forest Range Officer, Karnataka Forest Dept. Govt. of Karnataka
- Worked as a Lecturer in Poorna PU Science College, Dharwad from 2019-2021 Oct. and also worked as a faculty of NEET/JEE @Physics to various

institutions.

AREA OF RESEARCH: Nuclear Fuel Design & Fabrication

Nuclear Fuel manufacturing is very critical and plays a vital role in nuclear fuel cycle. The stringent chemical, physical and metallurgical requirements of nuclear fuel need to engineer into the nuclear fuel during manufacturing. The physical characteristics also need to engineer based on the operation conditions of the nuclear fuels which are quite harsh and also varying from reactor to reactor.

The nuclear fuels during their operation are subjected to harsh operating conditions like temperatures which range up to 1700C, high neutron flux environment which leads to physical and metallurgical changes.

PHWR:

At NFC, fuel is made for three types of Nuclear Reactors, namely Pressurized Heavy Water Reactor (PHWR), Boiling Water Reactor (BWR) and Fast Breeder Reactor (FBR).

PHWR fuel is manufactured from natural uranium dioxide. The raw material for the production of PHWR fuel is Magnesium Di-Uranate (MDU) or Uranium Ore Concentrate (UOC). MDU concentrate is obtained from the uranium mine and mill at Jaduguda, Jharkhand.

UOC is imported from various countries. MDU which contains about 55-65% 'U' or UOC is subjected to dissolution followed by specialized chemical treatment processes such as solvent extraction followed by precipitation of Ammonium Di-Uranate (ADU). Further steps of controlled heat treatment form sinterable Uranium dioxide (UO_2) powder.

The UO_2 Powder is further processed to high-density cylindrical pellets by various operations like pre-compaction, final compaction and sintering at high temperature (1700oC) in reducing atmosphere. The sintered pellets are then centre-less ground to desired dimensions.

The finished UO_2 pellets are encapsulated in thin walled Zircaloy tubes, both ends of which are sealed by resistance welding. Appendages such as spacers and bearing pads are resistance welded on these elements and 19 or 37 such elements of specified configuration assembled together by welding them on to end plates at either end to form fuel assembly.

19-element fuel assembly is designed for 220 MWe reactors and 37-element fuel assembly is designed for 540 MWe and 700 MWe reactors.

BWR:

Cylindrical UO_2 pellets of varying enrichments and chemical compositions imported from other countries are encapsulated in thin walled tubes of zirconium alloy, both ends of which are sealed by TIG welding. Elements with varying compositions are placed in a specified configuration such as 6x6 or 7x7 array along with spacer grids, stainless steel tie plates, zirconium alloy spacers and flow nozzles to form nuclear fuel assemblies.

FBR:

The Core subassemblies are hexagonal in shape with very thin wall special grade Stainless Steel (SS) tubes (circular and hexagonal) and precision SS components. These were fabricated with the know

how developed in-house and equipment / fixtures built with indigenous capabilities. Pelletisation of the thorium oxide (ThO_2) has been carried out for the first time on a large scale that involved considerable ingenuity and effort.

The fabrication of various FBTR core subassemblies involves unique operations like button forming and chrome plating on hexagonal tubes, crimping on clad tubes, bead forming on spacer wires, helical wire wrapping on pins etc. These operations are executed on special purpose machines which were also developed indigenously. The fabrication of FBTR fuel involves substantially high radioactivity, which in turn increases complications in manufacturing.

Deploying radiation protection lead shields at various process workstation help to overcome these challenges.

NFC fabricated and supplied core subassemblies like Fuel, Blanket, Control & Safety Rod, Diverse Safety Rod, Reflector, Inner Boron Carbide Shielding, Diluent, Purger, Source and Instrumented Central Subassemblies for initial core of PFBR. A typical PFBR Fuel subassembly consists of 1541 intricately machined components of more than 35 different types. This also involved supply of about 60,000 crimped tubes and 2.5 lakh precision fuel pin components fabricated in-house / outsourced meeting the stringent specifications involving Quality Assurance team of NFC and Quality Surveillance team of NPCIL / BHAVINI. The Core subassemblies are hexagonal in shape and are 4.5m long. The fabrication processes of most of the machining components were developed and outsourced due to bulk quantity requirements. The various equipment, fixtures and radiation shields were developed indigenously for unique operations like Spacer Wire Bead Forming, Wire Wrapping, Automatic TIG Welding, Button Forming, Robotic fuel pin assembly etc. NFC has also developed Automatic autogenously TIG welding technique for welding of very thin walled Fuel clad tubes and Hexagonal wrappers. The complexity of fuel subassemblies involves handling and manufacturing of substantially high radioactive fuel pins, which were overcome by deploying special automation techniques and (composite) radiation shields for protection against gamma and neutron radiation as per regulatory requirements and safety standards. In addition to this, a special fuel assembly shop / facility called have been established close to reactor site at Kalpakkam

In addition to this, NFC is also involved in planning and setting up of nuclear fuel fabrication facilities for fabrication of various types of pins and subassemblies required for annual reloads of PFBR and other FBRs.

Fabrication of Fuel for FBTR & PFBR with In-house / indigenous made equipments & fixture is very excellent example of **India's self reliance** and **Make in India policy**.

ACHIVEMENTs:

- Participated in National Level Seminar Conference On "CHALLENGES IN THE QUEST FOR CLEAN ENERGIES" held in Sankeshwar

- Participated in National Level Seminar Conference On " NUCLEAR ENERGY AND IT's APPLICATIONS" held at Rani Channamma University Belagavi
- Participated in “INTERNATIONAL YEAR OF CRYSTALLOGRAPHY, IYCR-2014” Workshop held at Karnataka Women University, Vijaypur
- Participated and Presented a paper on "CHALLENGES AND PROSPECTS OF NUCLEAR AND SOLAR ENERGY IN INDIA" held at B.V.V's Campus, Bagalkot
- Elected as a President of Dr.HOMI JAHANGEER BHABHA Physics Forum PG, Department of Physics and Nuclear Physics Specialisation ,BVV's Science College And Prof.C.N.R.Rao Research Centre,Bagalkot
- **Got first rank to the R.C.U.B. University, Belagavi, in M.Sc. and Got GOLD medal in Physics and Nuclear and Particle Physics specialisation**
- **Got Felicitation and Received gold medal,citation by H’ble Governor of Karnataka state Shri. VAJUBHAI R.VALA during 4th Convocation of Rani Channamma University,VIDYA SANGAMA,Belagavi**
- **Got Felicitation and Cash Award by Smt. UMASHREE, former District Incharge Ministerin, Bagalkote,and former Cabinet Minister Govt.of Karnataka**
- Participated as a Speaker “Webinar on Accelerators” conducted by PG Dept. of Physics, Basaveshwar Science College, Bagalkote

Declaration:

I hereby declare that the above mentioned details are true to the best of my knowledge and belief.