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	STANDARD: **NFPA 70E / OSHA 29 CFR 1910.269 / IEEE 693**	AUDIT FREQUENCY: **Monthly Audit**

High Voltage Electrical Substation Inspection Sop Template

Operational Scope: This standard operating procedure defines the mandatory inspection protocol for high-voltage electrical substations in oil, gas, and energy facilities to mitigate arc flash and electrocution hazards. Compliance ensures uninterrupted power distribution and strict adherence to federal electrical safety mandates.

MANDATORY PPE:	Arc-Flash Rated Face Shield & Balaclava (NFPA 70E Cat 4), Class 4 Rubber Insulating Gloves with Leather Protectors, Flame-Resistant (FR) Coveralls, Hard Hat with Dielectric Rating (ANSI Z89.1 Class E), Non-Conductive Steel-Toe Safety Boots (ASTM F2413), Safety Glasses with Side Shields (ANSI Z87.1)
PREREQUISITES:	Verify valid switching and lockout/tagout (LOTO) clearances for restricted zone entry. | Perform zero-energy verification using calibrated non-contact voltage detectors. | Ensure hot work permit and confined space entry clearance are active if applicable.

PERIMETER, SECURITY & STRUCTURAL INTEGRITY

#	COMPONENT / ITEM	VERIFICATION CRITERIA & ACCEPTANCE STANDARD	SEVERITY	STATUS
1	**Substation Security Fencing & Grounding**	Chain-link perimeter fence is bonded securely to the station ground grid; no breaches, rust spots, or unauthorized storage within 10 feet.	Warning	[ ] PASS [ ] FAIL [ ] N/A
2	**Warning & Danger Signage**	High voltage warning signs ('Danger - High Voltage') are visibly posted on all access gates and exterior walls in compliance with ANSI Z535.	Standard	[ ] PASS [ ] FAIL [ ] N/A
3	**Control House & Cable Trench Seals**	Cable entry points and conduits are tightly sealed with fire-stop compound to prevent rodent ingress and moisture accumulation.	Standard	[ ] PASS [ ] FAIL [ ] N/A

TRANSFORMERS, BUSHINGS & COOLING SYSTEMS

#	COMPONENT / ITEM	VERIFICATION CRITERIA & ACCEPTANCE STANDARD	SEVERITY	STATUS
4	**Main Power Transformer Oil Level & Leaks**	Conservator oil gauge is within normal operating temperature range; zero active oil leaks or weeping observed on gaskets and valves.	Critical (Immediate Out of Service)	[ ] PASS [ ] FAIL [ ] N/A
5	**Transformer Bushings & Porcelain Insulators**	Bushings are free of cracking, tracking, oil residue, or heavy particulate contamination; arcing horns are properly aligned.	Critical (Immediate Out of Service)	[ ] PASS [ ] FAIL [ ] N/A
6	**Silica Gel Breather**	Desiccant crystals are fully active (pink/blue transition status); oil cup at the base is filled to the indicated line.	Warning	[ ] PASS [ ] FAIL [ ] N/A
7	**Radiator Fans & Cooling Pumps**	Cooling bank automatic control switch operational; fan blades rotate freely without mechanical obstruction or abnormal vibration.	Warning	[ ] PASS [ ] FAIL [ ] N/A

SWITCHGEAR, BREAKERS & GROUNDING GRIDS

#	COMPONENT / ITEM	VERIFICATION CRITERIA & ACCEPTANCE STANDARD	SEVERITY	STATUS
8	**SF6 Gas Circuit Breaker Pressure**	SF6 gas density/pressure monitor is within the green operational zone adjusted for ambient temperature compensation.	Critical (Immediate Out of Service)	[ ] PASS [ ] FAIL [ ] N/A
9	**Surge Arresters & Disconnect Switches**	Surge arresters show no physical cracking or counter-register abnormalities; disconnect blades are fully seated and locked.	Critical (Immediate Out of Service)	[ ] PASS [ ] FAIL [ ] N/A
10	**Substation Ground Mat & Copper Risers**	Exothermic welds and mechanical connections to structural steel and equipment frames are intact and free of corrosion.	Critical (Immediate Out of Service)	[ ] PASS [ ] FAIL [ ] N/A

Certified Electrical Inspector / Substation Technician Signature: _____	**Date / Time:** _____	**Badge / Cert #:** _____
Site Safety Supervisor / High Voltage Operations Manager Sign-off: _____	**Review Date:** _____	**Audit Status:** [ ] Approved [ ] Rectify

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