OpsAuditHub opsauditihub.com	DOC ID: **SAF-0311**	REVISION: **Rev 2.4 (2026)**
	STANDARD: **API 537, OSHA 29 CFR 1910.119 (PSM), and ISO 45001**	AUDIT FREQUENCY: **Monthly Audit**

Flare Stack Operational Safety Audit Sop Template

Operational Scope: This standard operating procedure establishes the mandatory audit requirements for industrial flare stack systems to mitigate catastrophic ignition, structural failure, and environmental hydrocarbon release risks. Compliance with this audit protocol ensures adherence to federal process safety management regulations and operational integrity baselines.

MANDATORY PPE:	Flame-Resistant Clothing (FRC NFPA 2112), Hard Hat with Chin Strap (ANSI Z89.1), Impact-Resistant Safety Glasses (ANSI Z87.1), Steel-Toe Metatarsal Boots (ASTM F2413), H2O/Combustible Gas Portable Monitor, High-Visibility Thermal Work Vest
PREREQUISITES:	Verify weather conditions are within safe operating limits (wind velocity under 40 mph, no active electrical storms). | Review control room SCADA logs for unacknowledged flare pilot alarms or purge gas pressure anomalies. | Obtain active Hot Work and Confined Space Entry permits if physical climbing or maintenance is required.

IGNITION AND COMBUSTION CONTROL SYSTEMS

#	COMPONENT / ITEM	VERIFICATION CRITERIA & ACCEPTANCE STANDARD	SEVERITY	STATUS
1	**Pilot Burner Assemblies**	Confirm continuous flame presence via thermocouple temperature telemetry and optical UV/IR scanners without fluctuation.	**Critical (Immediate Out of Service)**	[ ] PASS [ ] FAIL [ ] N/A
2	**Auto-Ignition System (High Energy/Spark)**	Test backup igniter staging panel response; spark generator must deliver nominal voltage output without ground faults.	**Critical (Immediate Out of Service)**	[ ] PASS [ ] FAIL [ ] N/A
3	**Purge Gas Flow & Molecular Seal**	Verify nitrogen or natural gas purge pressure maintains positive velocity to prevent air ingress and flashback hazards.	**Critical (Immediate Out of Service)**	[ ] PASS [ ] FAIL [ ] N/A

STRUCTURAL INTEGRITY AND PIPING MECHANICALS

#	COMPONENT / ITEM	VERIFICATION CRITERIA & ACCEPTANCE STANDARD	SEVERITY	STATUS
4	**Flare Derrick & Guy Wires**	Inspect structural lattice for corrosion, bolt torque integrity, and proper tensioning of guy wires without slack.	**Warning**	[ ] PASS [ ] FAIL [ ] N/A
5	**Refractory Lining (Flare Tip)**	Inspect internal refractory shields for cracking, spalling, or localized hot spots visible via thermal imaging.	**Warning**	[ ] PASS [ ] FAIL [ ] N/A
6	**Knockout Drum & Liquid Seal**	Check liquid level transmitters and high-level alarms to prevent liquid carryover into the flare stack burner.	**Critical (Immediate Out of Service)**	[ ] PASS [ ] FAIL [ ] N/A
7	**Steam / Air Assist Piping**	Inspect atomizing steam or air manifolds for valve actuation responsiveness, condensation traps, and insulation integrity.	**Standard**	[ ] PASS [ ] FAIL [ ] N/A

INSTRUMENTATION, ESD, AND ENVIRONMENTAL CONTROLS

#	COMPONENT / ITEM	VERIFICATION CRITERIA & ACCEPTANCE STANDARD	SEVERITY	STATUS
8	**Emergency Shutdown (ESD) Interlocks**	Simulate emergency shutdown logic loop to verify automated isolation valves close within specified safety timing parameters.	**Critical (Immediate Out of Service)**	[ ] PASS [ ] FAIL [ ] N/A
9	**Continuous Emissions Monitoring (CEMS)**	Validate opacity and flow meter calibration data against reference standards to ensure EPA compliance reporting accuracy.	**Warning**	[ ] PASS [ ] FAIL [ ] N/A
10	**Flame Front Generator (FFG) Cabinet**	Ensure exterior purge gas enclosure is pressurized, free of moisture, and flame arrestors are clean and unblocked.	**Standard**	[ ] PASS [ ] FAIL [ ] N/A

Certified Flare Systems Auditor / Lead Operations Technician Signature: _____	**Date / Time:** _____	**Badge / Cert #:** _____
Plant Safety Supervisor / Process Safety Manager Sign-off: _____	**Review Date:** _____	**Audit Status:** [ ] Approved [ ] Rectify

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