

Hot Work Procedure

**BP WIND ENERGY
OPERATIONS POLICIES AND PROCEDURES**

HOT WORK PROCEDURE

[Document Control Details](#)

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1.0 Purpose

- 1.1 The purpose for the BPWE Hot Work procedure is to establish the minimum requirements for personnel to follow when conducting Hot Work activities.
- 1.2 Permitting of Hot Work activities is a key component in controlling work on a location.

2.0 Reference

- 2.1 The Reference section is used to provide a list of other documents referred to in this procedure.
- 2.2 [BP Control of Work Standard](#)
- 2.3 [American Petroleum Institute, RP 500](#)
- 2.4 National Fire Protection Association, [NFPA 51B Standard for Fire Prevention During Welding, Cutting, And Other Hot Work](#).
- 2.5 National Fire Protection Association, [NFPA 70 National Electrical Code](#)
- 2.6 Occupational Safety and Health Administration, Department of Labor, [29 CFR 1910.119 \(k\)](#), and [252 \(a\)](#)
- 2.7 [BP's Golden Rules](#)
- 2.8 BPWE Hot Work, Cold Work, Confined Space, and Electrical permit form.

3.0 Scope

- 3.1 This procedure is applicable to all BP Wind Energy employees and BOP contractors that intend to perform Hot Work activities on BP Wind premises.
- 3.2 O&M agreements require that permanent on-site contractors have a Hot Work procedure that meets or exceeds the requirements of the BPWE Hot Work procedure. If the contractors' agreement does not meet this requirement, the contractor must default to and follow the BPWE Hot Work procedure.

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4.0 Responsibilities

Roles	Responsibilities
Designated Person-In-Charge (PIC)	<ul style="list-style-type: none"> • Must be familiar with Hot Work safe practices. • Must know applicable BP and regulatory requirements, policies, standards, and procedures. • Is responsible for safety of facility operations. • Confirms proper documentation is present in work area. • Inspects job site at beginning, during (as needed), and at the end of the job to confirm safety and cleanliness. • Communicates directly with applicable Issuing Authority (IA) about operations that could impact the proposed Hot Work.
Issuing Authority (IA)	<ul style="list-style-type: none"> • Must be familiar with Hot Work safe practices. • Issues Hot Work permits. • Confirms welding and burning equipment has been inspected to verify that it is in good condition. • Confirms welders are certified and/or have proven experience. • Verifies calibration and bump check of Lower Explosive Level (LEL) monitoring has been conducted. • Confirms necessary gas tests for oxygen explosiveness are conducted. • Confirms continuous combustible gas monitoring is conducted. • Confirms fire extinguisher(s) and/or other safety equipment is inspected. • Confirms all parts of this plan are followed. • Signs the permit. • Confirms the work area is inspected as necessary during the work and upon completion. • Prohibits other operations that may conflict with the permitted work. • Instructs all personnel to stop work if a change occurs that could create an unsafe condition.

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Roles	Responsibilities
Fire Watch	<ul style="list-style-type: none"> • Must have no other assigned duties. • Has been properly trained in the duties of a Fire Watch. • Has Personal Protective Equipment needed to perform work safely. • Wears a brightly colored vest, (i.e., orange) as identification. • Understands operation and limitations of combustible gas monitor. • Must continuously monitor designated area with a LEL monitor during the process of the permit. • Stops work if combustible gas monitor registers over 0 percent. • Stops Hot Work if sparks, flames, or hot metals are projected outside the permitted area or when flammable gases are suspected. • Has an inspected fire extinguisher in proper operating condition in their possession. • Is familiar with the facility emergency notification procedures. • Knows access and exit procedures. • Knows potential sources of hydrocarbons in the area. • Knows of non-hydrocarbon hazards which may be present. • Remains on location 30 minutes after work completion to watch for smoldering fires.
Personnel Doing Work	<ul style="list-style-type: none"> • Must be familiar with Hot Work safe practices. • Complies with the conditions of the permit. • Must know applicable BP and regulatory requirements, policies, standards, and procedures. • Safe handling of welding/burning equipment and processes. • Participates in the inspection of welding and burning equipment and work area(s). • Reports unsafe conditions to IA immediately for evaluation and appropriate action. • Uses only industry-approved methods of lead splicing. • Attaches torch lighters or strikers to the welding cylinders or carry them in a toolbox or bag. <p style="background-color: #e1f5fe; margin-top: 5px;">WARNING: Torch lighters or strikers are never to be carried on oneself.</p>

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5.0 Acronyms and Definitions

Acronym	Definition
AC	Alternating Current
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
BU	Business Unit
CoW	Control of Work
DC	Direct Current
HSSE	Health, Safety, Security, and Environmental
IA	Issuing Authority
ISO	Isolating Authority
JSEA	Job Safety Environmental Analysis
LEL	Lower Explosive Limit
LO/TO	Lockout/Tagout
MOC	Management of Change
P&ID	Piping and Instrumentation Diagram
PA	Performing Authority
P&ID	Piping and Instrumentation Diagram
PIC	Person In Charge
PPE	Personal Protective Equipment
PTW	Permit To Work
SIMOPS	Simultaneous Operations
SM	Site Manager
SPM	Safe Practices Manual
WCC	Work Control Certificate

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Term	Definition
Authorized Gas Testers (AGT)	Personnel who test for the presence of flammable vapors, toxic gases, and oxygen as instructed by the Issuing Authority prior to and during work covered by a permit. Authorized Gas Testers shall be trained on the specific monitor in use.
Bump Calibration Check (Functional)	Applying a known gas (per manufacturer's directions) to verify that a meter is working.
Cold Cutting	The practice of using non-spark producing tools to cut or drill through piping, equipment, or vessels that have the potential to contain a flammable substance.
Combustible Gas and Oxygen Monitor	An HSSE Team approved direct-reading instrument that measures oxygen levels and combustible atmospheres.
Combustible Material and Flammable Material	Substances that will support combustion once ignited.
Confined Space	<p>A space that has all three of the following criteria:</p> <ul style="list-style-type: none"> • Large enough and so configured that an employee can physically enter • Limited or restricted means for entry or exit • Not designed for continuous employee occupancy <p>Examples of confined spaces are tanks, vessels, silos, storage bins, hoppers, vaults, and pits.</p> <p>It can be any enclosed or partially enclosed space where there is a risk of death or serious injury from hazardous substances or dangerous conditions (e.g., lack of oxygen, toxic or combustible gases) may be present.</p>
Control of Work (CoW)	A formal approach to manage work risk with a procedural form of control. CoW uses processes and systems to regulate work activities (i.e., the power to direct)
Designated Alternate	Person authorized in writing or verbally by a supervisor to represent that supervisor in completing the requirements of this section. The Designated Alternate assumes all of the responsibilities of the person they are representing in relation to this practice.
Fire Watch	Properly trained personnel assigned to guard against fire during Hot Work activities. The Fire Watch shall be supplied with firefighting equipment.
Hazardous Area	<p>Any area in which flammable gases or liquids are or can be present in ignitable concentrations:</p> <ul style="list-style-type: none"> • <i>Class 1, Division 1</i> is defined as a hazardous area in which ignitable concentrations of gases or vapors can occur under normal conditions. This may be due to leaks or release of gases during repairs and maintenance. It also includes areas that become hazardous when faulty operation of equipment/processes or equipment breakdown leads to a build-up of flammable gases or vapors.

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	<ul style="list-style-type: none"> Class 1, Division 2 is defined as a hazardous area in which flammable liquids or gases would be present if their confinement system fails, operates abnormally, or breaks down. It also includes areas that are normally vented, but become hazardous when the ventilation system fails or operates abnormally. Areas adjacent to Class 1, Division 1 locations are included if ignitable concentrations of gases or vapors might occasionally be communicated.
Hot Bolting	Hot Bolting is the practice of removing and replacing or freeing and re-tightening bolts on live piping and equipment (e.g. removal/replacement of flange bolts on a flanged pipe connection while it is pressurized and in-service).
Hot Tapping	The process of safely tapping into a pressurized system that is in full or normal operation.
Hot Work	Any work that involves burning, welding, using fire- or spark-producing tools, or that produces a source of ignition.
Inerting (in conjunction with equipment, tanks, vessels, and piping)	Having little or no ability to react, as nitrogen that occurs uncombined in the atmosphere, i.e., something that is not chemically active.
Issuing Authority (IA)	<p>Designated BP welding or Hot Work supervisor/operator directly responsible for confirming that all necessary and required precautions and or procedures are followed prior to approving the permit.</p> <p>The (IA) is the central figure in the day-to-day management of the permit process within their area of responsibility, including issuing permits consistent with all associated practice and permit requirements. This person is responsible for insuring that he or she fully understands the work that will be done under his or her authority; he or she insures that there are not simultaneous operations (SIMOPS) clashes within the work groups where incongruent tasks would be performed in close proximity that could result in an unplanned event. The IA may be the Lead Technician.</p>
Performing Authority (PA)	The Performing Authority is the responsible person for the activity being carried out on the work site under the Control of Work Policy, practices, permits, and Work Control Certificate (WCC). The PA is accountable to the IA/AA for safe delivery of all work activities. The Performing Authority may be the person carrying out the task or may be supervising a group of people carrying the job. The Performing Authority can be responsible for more than one task at any one time, providing the tasks can be safely managed concurrently. The PA may serve as the IA if competent in the permit practice and requirements in question. However, the PA cannot serve as the AA. The PA and AA cannot be the same person. Each Permitted task must have a separate PA and AA, [pg 7, Permit to Work Guide]
Person in Charge (PIC)	The PIC is an onsite individual that has working knowledge of all work activities being performed by all groups/personnel working on location, and directly responsible for the operation or field location. The PIC can be a site supervisor, Designated Alternate, or construction representative.

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Spark-Producing Devices	A device that may create a source of ignition by generating a spark. The following are examples of a spark-producing device: <ul style="list-style-type: none"> • Opening energized electrical junction boxes • Welding machines • Performing sand blasting • Use of electrical tools, cell phones, or cameras.
Tool Box Meeting, Pre-Job Meetings/Tower Meetings and JSEA Meetings	Meetings of all personnel involved in a particular task. The intent is to understand the task and any associated hazards and to identify actions to mitigate these hazards.

6.0 PROCEDURE

6.1 Overview

A. A Hot Work permit is required to conduct Hot Work activities outside of designated safe welding areas. Hot Work includes, but is not limited to, the following activities:

- Electric arc welding
- Cad Welding
- Torch cutting
- Grinding
- Working using an open flame
- Hot tapping
- Portable heaters or steamers
- Electrical tools/equipment (not explosion proof or intrinsically safe.)
- Sand blasting (static)
- Jackhammer
- Chipping

6.2 Welding and Burning Areas

- A.** All welding and burning requires a Hot Work permit. **THERE ARE NO EXCEPTIONS TO THIS REQUIREMENT.** The following rules apply to these situations:
- The Hot Work shall be conducted within an identified area with boundaries (e.g., barricade, flagging, etc.).
 - The area shall be well ventilated, preferably not enclosed, and free of a flammable atmosphere.
 - Flooring and wall material shall be non-combustible. If welding must be conducted on combustible floors, the floors shall be made to be non-combustible by being wet down, covered with wet sand, metal or other fire-resistant shields such as fire

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blankets or tarps.

- Floors shall be swept clean of any potentially combustible materials.
- Floor penetrations and cracks in walls, decks, or flooring within 35 feet in all directions of the Hot Work area shall be tightly covered to prevent passage of sparks to adjacent areas.
- Combustible or flammable material (i.e., paraffin, rags, paper, and residual hydrocarbons) within 35 feet in any direction (horizontal or vertical) of Hot Work shall be relocated, protected with flame-proof covers, or shielded with flame-proof guards/curtains.
- Equipment containing hydrocarbons or flammable substances must be moved at least 35 feet horizontally from the welding area. Similar equipment on lower decks should be moved at least 35 feet from the point of impact where slag, sparks, or other burning material could fall. If moving this equipment is impractical, shield or cover that equipment with metal or fire-resistant guards or curtains, or render the flammable substances inert.

6.3 Pre-planning

- A. Define the need for the work/job. Consider whether or not the work/job can be designed out. Discuss alternatives.
- B. Review P&IDs and area classifications.
- C. Determine if an MOC is required.
- D. Discuss who should be involved in planning.
- E. Develop scope of work and justification. Check for downtime issues and other potential impacts on operations.
- F. Identify resources, qualifications, and certifications needed for the job.
- G. Review roles and responsibilities.
- H. Develop an equipment list and energy isolation list (lockout/tagout).
- I. If available, review previous job procedures, JSEAs, and lessons learned.
- J. Check weather forecast.
- K. Schedule work.

6.4 Inspection of the Work Area and Surrounding Area

- A. Verify that special precautions and preparation of the work area have been performed in accordance with BP safety requirements.
- B. Verify that the equipment and work area has been inspected (daily) by the Performing Authority and other personnel performing the Hot Work. Discrepancies must be corrected before beginning any Hot Work.
- C. Consider hazards associated with instrument gas (steel tubing, pilots, controllers, poly-flo, etc.).
- D. Consider wind direction and any possible impact of sparks and slag outside of 35 feet.
- E. Verify (if applicable) plugs and drains are covered with water to prevent sparks from entering or gas/vapor escaping.

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- F. Verify the area is adequately ventilated. When welding, consider the potential hazard created by metal fumes.

WARNING: The personnel performing the Hot Work and the Fire Watch must confirm that heat transmission through steel members or pipe does not cause a fire hazard.

- G. Contain the sparks/slag or keep them away from fuel and ignition sources.

NOTE: Depending on where sparks are landing, additional Fire Watches may be needed on different levels to manage the area.

- H. Properly orient fire blankets or fire cloth tarps to prevent pocket areas from forming.

NOTE: Do not hang or drape tarps in such a manner that gas may accumulate or become trapped.

- I. Wet fire blanket or fire cloth tarps if possible.
- J. Use the correct weight and thermal protection of fire blanket for the work to be conducted. A heavier weight and fire resistance rating will be required when arc gouging or cutting than is required for grinding and welding.
- K. In addition, for Hot Work involving welding machines:
- Try to locate the welding machine as close as possible to the work area.
 - Try to locate the welding machine in an unclassified area.
 - Grounding clamps and lugs must be tight and free of paint or other type of treated metal that would interfere with the ground.
 - Consider the path of the welding lead. What type of equipment is it lying across?
 - Shut down welding machine when relocating leads.
- L. Provide adequate means of communication among the crew. For example: does each Fire Watch have a radio, etc.?
- M. Discuss emergency plan with all crew members.

The job site must be inspected as often as necessary to confirm the area remains safe for work to continue. During Hot Work activities, The IA must be on the facility and shall not leave the facility until after all Hot Work activity has been completed.

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6.5 Site Preparation and Inspection

A. Energy Isolation

Adhere to the following rules for energy isolation:

- A hazardous situation could be created when a lockout/tagout procedure enables the opening of lines and/or vessels which could allow a release of flammable material. The resulting hazardous area consists of the geographical limits which released vapors could remotely reach.
- The Issuing Authority (IA) shall not issue a Hot Work permit for any area made potentially hazardous by a lockout/tagout procedure.

B. Welding Precautions

Adhere to the following rules for welding:

- Inspect and position welding equipment, lay out leads, select appropriate ground connections and locations, hang tarps, plug drains, and monitor discharge points.
- Follow the safety requirements in the AE Safe Practices manual Confined Space Entry Program to confirm that the space is safe for work to be conducted when Hot Work is to be performed in confined spaces, containers, or vessels.
- Adequately ventilate enclosed spaces or containers when Hot Work is performed.
- Remove gas burning and welding torches and hoses from all vessels and closed containers at the end of any shift, at meal time, or other time when work is discontinued.
- Prior to specialized welding, such as pipeline repair, hot tapping, etc., site and project-specific procedures shall be developed to confirm that operations will be conducted in a safe manner.
- As a general rule, all welding leads, inert gas hoses, oxygen and acetylene hoses, etc. should be hung overhead at a height of no less than 6' instead of being placed on the ground, floor or deck where they could be damaged. Whenever welding leads are run overhead, they should not be run directly through scaffolding since they could arc or be damaged thereby electrifying the scaffold.

C. Inerting Tanks, Vessels, Piping and other Equipment

Inerting is required:

- Before welding or heating any hollow vessel or equipment, such as ball floats, pistons, impellers, vessels, pipes, valves, fittings, or similar equipment that has been in any kind of service.
- When equipment within the Hot Work permit area containing hydrocarbons or other flammable substances cannot be moved.

At a minimum, inerting entails the following steps:

- Isolate equipment inlet and outlet valves. Blinding or disconnection is required.
- Bleed equipment to zero pressure.
- Remove or displace flammable material out of equipment with inert gas, such as nitrogen, or water.

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- Isolate all sources of fuel/instrument gas to production equipment controllers, preferably by disconnecting supply lines to controllers.

NOTE: Welding or heating closed systems is prohibited due to potential for overpressure of liquids within containment.

6.6 Permitting Process

A. Checking and Monitoring for Combustible Gas

- Prior to issuing a Hot Work permit, the proposed work area must be surveyed for hydrocarbons using an approved combustible gas monitor or explosimeter. Hot Work shall not be performed if more than 0 percent LEL is detected.
- The check for hydrocarbons should be conducted as close to the starting time of the Hot Work as possible. Once the proposed work area is found free of hydrocarbons, the Performing Authority (PA) shall confirm combustible gas monitoring is conducted at least hourly.

WARNING: LEL readings shall be recorded on the Hot Work permit.

NOTE:

1. When performing Hot Work activities, work shall stop every hour, or sooner if deemed necessary, to have a thorough check of the area for LEL. This reading shall be documented on the Gas Check Log.
2. Normal combustible gas monitors do not accurately measure combustible gas in a tank or space where oxygen concentrations are below 16%. If inert gas, such as nitrogen, is present, use of specialized monitoring equipment is required. Consult the HSSE group for the availability of specialized monitoring equipment.

- The Fire Watch shall continuously monitor during the Hot Work covered by the permit. The monitor shall not be turned off during any Hot Work activity.

B. Calibration of Portable Combustible Gas Monitors

- Meters shall be used in accordance with the manufacturer's recommendations for determining the LEL of combustible gas in air. Verify calibration of the unit and "bump check" to verify that the meter is working.
- The work area shall be rechecked prior to resuming Hot Work after any break of two hours or more.

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NOTE: LEL is the lowest concentration of flammable gas or vapor and air that can be ignited to cause self-sustaining flame. Instruments should express the flammability range of vapors or gases in percent of the LEL. Instruments expressing percent gas should be reworked to express percent of the LEL.

- Combustible gas monitors shall be inspected and field-calibrated in accordance with the manufacturer's instructions. Calibration frequency shall not exceed 30 days. If the monitor has been dropped or otherwise damaged and calibration is questionable, the monitor shall be recalibrated.
- If the instrument is to be used numerous times during a shift, it is only necessary to verify calibration prior to initial use, unless the monitor has been dropped or otherwise damaged, in which case the monitor shall be recalibrated.
- Field calibration records shall be documented and maintained on location at the facility.

6.7 Permit Signatures and Duration

- A. After the area is rendered safe for Hot Work and all affected parties are notified, the Hot Work Permit must be filled out and necessary approval signatures obtained, as outlined in the Permit to Work chapter. When performing Hot Work, the following signatures are required:
- Issuing Authority (IA)
 - Performing Authority (PA)
 - Fire Watch
 - Other affected parties (if applicable)
 - Person in Charge (IA/Site Manager)
 - A copy of the permit shall be noticeably displayed
- B. A copy of the permit shall be noticeably displayed in the office or facility monitoring room and an additional copy shall be noticeably displayed at the Hot Work site.
- C. Permits shall only be approved for the work scope and time period specified on the permit. The original permit shall be cancelled and a new Hot Work permit issued if:
- The work lasts more than 16 hours.
 - There is a change in personnel.
 - Circumstances outside the scope of the original permit are identified.

6.8 Execution of Hot Work and Monitoring of the Job

- A. After all necessary approval signatures have been obtained, the Hot Work can commence.
- B. The work area must be continuously monitored with a portable combustible gas monitor. The Performing Authority (PA) shall re-inspect the work area and crew as necessary.

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- C. All personnel are obligated to immediately stop the work covered by the Hot Work permit if they consider the prevailing conditions or work methods to be unsafe. If doing so, then:
- Inform the person or persons doing the work of the hazard detected.
 - As appropriate, take action to protect personnel and the environment.
 - If appropriate, take emergency action such as sounding the emergency alarm, activating the emergency shutdown, and/or activating the fire suppression system.
 - The Fire Watch must remain on duty to monitor the area for 30 minutes if work stops for a break or meal.
 - Immediately contact the IA and state the reasons for the work stoppage.
- D. Some examples of reasons for exercising stop work authority include:
- Fire alarm sounded.
 - LEL above 0 percent.
 - Emergency release of gas/hydrocarbons.
 - Work stopped due to perceived unsafe practices.
 - Venting due to compressor shutdown.
- E. When work is stopped due to someone exercising stop work authority, work may only resume when the area is again rendered safe and the designated PIC and IA visit the work site to determine if the Hot Work permit should be re-issued.

NOTE: Approval from the IA must occur before work can continue

6.9 Completion of Job and Job Closeout

- A. Upon Hot Work completion, the individual(s) performing the work shall notify the designated PIC and/or IA, who will then verify the completion, safety, and cleanliness of the site.
- THE FIRE WATCH SHALL REMAIN ON LOCATION 30 MINUTES AFTER WORK COMPLETION TO MONITOR THE AREA AND WATCH FOR SMOLDERING FIRES.**
- B. The bottom portion of the Hot Work permit shall be completed (signed) by the IA and Fire Watch no more than 30 minutes after Hot Work completion.
- C. Final documentation of completed Hot Work permits and Fire Watch Surveys shall be closed-out with the required signatures and kept on location.

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7.0 Training

- 7.1 All personnel must receive initial training as it relates to their duties for hot work. Refresher training for all affected employees will be conducted in accordance with the BU safety training matrix or when there is a significant change in the procedure. All training must be documented.
- 7.2 Individuals performing atmospheric testing or deploying continuous monitoring equipment must be trained on the following topics:
- A. Proper use, care and field calibration of the gas test equipment,
 - B. Proper technique for conducting the hot work atmospheric testing,
 - C. Proper deployment and monitoring of continuous monitoring equipment.
- 7.3 Individuals acting as a fire watch must be trained on the following topics:
- A. Basic site overview of where the hot work is being conducted,
 - B. Proper techniques for monitoring for any changes affecting permit conditions; or for any signs of small or smoldering fires,
 - C. Proper activation and use of fire protection equipment,
 - D. Proper operation of a combustible gas testing instrument,
 - E. Proper use of communication system/equipment,
- 7.4 All training shall be documented and kept on file.

8.0 Auditing

- 8.1 Hot Work activities shall be audited at least once per quarter.
- A. If there are no open Hot Work permits at the time of the audit, then closed permits shall be audited.
 - B. Control of Work (CoW) audit form 40_000019_Att-A shall be used to conduct these audits.
- 8.2 This procedure shall be audited every three years.

9.0 Attachment A – BP Wind Energy – Hot Work Permit



HSSE 13.51.01 Hot
Work Permit....

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Document Control Details

Document Name		Hot Work, Safe Welding Practices		
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