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FUGITIVE GAS REMEDIATION (FGR) SYSTEM WITH MONITORING

Abstract

A fugitive gas remediation (FGR) system for monitoring and eliminating fugitive gas, such as surface casing vent gas produced from the casing head of an oil well, or so-called casinghead or Bradenhead gas, and other fugitive gas sources. An enclosure is positioned at a site with a fugitive gas source, such as a wellhead. A separator is located in the enclosure to remove liquid from the fugitive gas. A catalytic heater is located in the enclosure and coupled to the separator to react with the fugitive gas and produce heat in the enclosure. A pilot gas source can provide pilot gas to the catalytic heater. A flow meter is carried by the enclosure and coupled to the fugitive gas source to measure a flow rate of fugitive gas. A transmitter carried by the enclosure and operatively coupled to the flow meter to transmit a signal carrying the flow rate.

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Background/Summary

BACKGROUND

[0001] The present invention relates generally to a fugitive gas remediation system for monitoring and eliminating surface casing vent gas produced from the casing head of an oil well, or so-called casinghead or Bradenhead gas, and other fugitive gas sources.

[0002] In oil and gas wells, low-pressure and low-volume surface casing vent gas (fugitive gas emissions) can leak up between the casing and the cement of the well. In the past, this gas has been blown back down the well, escaped to the atmosphere, or been flared-off. Some states have increased regulatory requirements for, and many companies have specified, a safe, clean and efficient means of managing Bradenhead pressures and the ensuing fugitive gas emissions. Some states mandate that the gas pressure cannot exceed 50 psi to resist contaminating ground water.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] Features and advantages of the invention will be apparent from the detailed description which follows, taken in conjunction with the accompanying drawings, which together illustrate, by way of example, features of the invention; and, wherein:

[0004] FIG. **1** is a perspective view of a fugitive gas remediation (FGR) system in accordance with one embodiment, shown with walls of a skid removed for visibility.

[0005] FIG. **2** is a perspective view of the FGR system of FIG. **1**, again shown with the walls of the skid removed for visibility.

[0006] FIG. **3** is a schematic pipe diagram of the FGR system of FIG. **1**.

[0007] FIG. **4** is a perspective view of the FGR system of FIG. **1**, shown with the wall on the skid forming an enclosure.

[0008] FIG. **5** is a partial internal perspective view of the FGR system of FIG. **1**, showing a portion of an inside of the enclosure and the skid.

[0009] FIG. **6** is a partial internal top view of the FGR system of FIG. **1**, showing a portion of the inside of the enclosure and the skid.

[0010] FIG. **7** is a perspective view of the FGR system of FIG. **1**.

[0011] FIG. **8** is a perspective view of another FGR system in accordance with another embodiment, shown in an open configuration.

[0012] FIG. **9** is a perspective view of the FGR system of FIG. **8**, shown in a closed configuration.

[0013] FIG. **10** is a partial perspective view of the FGR system of FIG. **8**.

[0014] FIG. **11** is a partial perspective view of the FGR system of FIG. **8**.

[0015] Reference will now be made to the exemplary embodiments illustrated, and specific language will be used herein to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended.

DETAILED DESCRIPTION

[0016] Before invention embodiments are disclosed and described, it is to be understood that no limitation to the particular structures, process steps, or materials disclosed herein is intended, but also includes equivalents thereof as would be recognized by those ordinarily skilled in the relevant arts. It should also be understood that terminology employed herein is used for the purpose of describing particular examples only and is not intended to be limiting. The same reference numerals in different drawings represent the same element. Numbers provided in flow charts and processes are provided for clarity in illustrating steps and operations and do not necessarily indicate a particular order or sequence. Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this disclosure belongs.

[0017] An initial overview of the inventive concepts are provided below and then specific examples are described in further detail later. This initial summary is intended to aid readers in understanding the examples more quickly, but is not intended to identify key features or essential features of the examples, nor is it intended to limit the scope of the claimed subject matter.

[0018] It has been recognized that it would be advantageous to develop a system and method for eliminating or destroying methane emissions to the atmosphere while maintaining Bradenhead pressure within company required and state mandated limits. A fugitive gas remediation (FGR) system and method is presented for combining pressure management and fugitive gas destruction which eliminates undesirable methane emissions to the atmosphere, while maintaining Bradenhead pressure within specified limits. The FGR system can monitor and eliminate casing vent gas from a wellhead, and/or other undesirable low-pressure and low-volume gas that escapes a system. The FGR system can destroy the vent gas in real time without flaring. The Bradenhead gas is reacted in a catalytic heater. In one aspect, no gases are vented into the atmosphere. In another aspect, a pilot gas system can be employed to ensure constant operation in the event the Bradenhead gas pressure/flow falls too low to sustain a catalytic reaction. The FGR system can automatically shift from pilot gas to Bradenhead gas. In another aspect, a booster unit can be used in unison with a primary unit to provide additional capacity if the Bradenhead gas flow exceeds the capacity of the primary unit. The systems can be pressure rated at or above the wellhead pressure to contain, rather than release, pressure and gas flow. In one aspect, the FGR system can be used adjacent to a wellhead to eliminate casing vent gas. In another aspect, the FGR system can be used adjacent storage tanks. In another aspect, the FGR system can be used with instrumentation gas.

[0019] Referring to FIGS. **1**-**7**, an FGR system **10** in accordance with one embodiment is shown for monitoring and eliminating fugitive gas, such as casing vent gas, or Bradenhead gas, from a wellhead or any location requiring fugitive gas remediation. The FGR system **10** can comprise an enclosure **18** (FIGS. **4** and **7**) to be positioned at a site with a fugitive gas source, such as a well site adjacent to the wellhead. In one aspect, the enclosure **18** can be substantially enclosed so as to form a majority enclosure. In another aspect, the enclosure **18** can form a super-majority enclosure. The enclosure **18** can have openings therein for piping, venting, and air intake.

[0020] In one aspect, the FGR system **10** and the enclosure **18** can comprise a mobile skid **22** with a floor **26**, a roof **30**, and a perimeter wall **34** (FIG. **4**). The floor **26** can be configured to be elevated and/or to have lower openings below the floor **26** to accommodate the forks of a forklift. In another aspect, the system **10**, the enclosure **18** and the skid **22** can have eyelets **38** secured to a top thereof to allow the system **10**, the enclosure **18** and the mobile skid **22** to be lifted with hooks, cables and a crane or loader. The system **10**, the enclosure **18** and the skid **22** can be deliverable to a site with the fugitive gas source, such as adjacent the wellhead, and can be located on the ground. In one aspect, the skid **22** can be sized relatively small to fit in existing wellhead sites. For example, the skid **22** can have a footprint less than 4×8 ft. In addition, the roof **30** can have a vent **42** to vent the enclosure **18**. The vent **42** and/or other vents, such as in the walls **34**, can allow heat to escape and/or air (and oxygen) to enter.

[0021] The enclosure **18** and the skid **22** can have and can carry an inlet **46** to be coupled to the fugitive gas source, such as a valve of the wellhead or a casing vent gas source. In one aspect, the enclosure **18** and the skid **22** can have and can carry a pilot gas inlet **50** to be coupled to a pilot gas source. The pilot gas inlet allows pilot gas into a pilot gas system to ensure constant operation in the event the Bradenhead pressure and/or flow falls too low to sustain a catalytic reaction. Thus, the FGR system **10** avoids release of Bradenhead to the atmosphere. The FGR system **10** can shift from pilot gas to Bradenhead gas automatically.

[0022] A scrubber or separator **54** can be located in the enclosure **18** and on the skid **22** and coupled to the inlet **46**. The separator **54** receives the fugitive gas or casing vent gas, and removes any liquid. The scrubber or separator **54** can remove liquid from the casing vent gas. The liquid can be stored for subsequent removal. In one aspect, the separator **54** can be positioned towards one side of the enclosure **18** and the skid **22**.

[0023] A catalytic heater **58** can be located in the enclosure **18** and on the skid **22**. The catalytic heater **58** can be coupled to the separator **54** to receive dry fugitive gas. The catalytic heater **58** can react with the fugitive gas to burn the fugitive gas and produce heat in the enclosure **18** and the skid **22**. The catalytic heater **58** can heat to over 300 degrees Fahrenheit to initiate a chemical reaction that destroys the vent gas. In one aspect, the catalytic heater **58** can be positioned at another opposite side of the enclosure **18** and the skid **22**, opposite the separator **54**. The catalytic heater **58** can be oriented to face the separator **54** so that heat from the catalytic heater **58** is directed towards the separator **54**.

[0024] In one aspect, a panel **62** can be positioned in the enclosure **18** and on the skid **22**. The panel **62** can have multiple bays **66**. Each bay **66** can receive a catalytic heater **58**. Thus, the FGR system **10** can have at least one catalytic heater **58**. In one aspect, the FGR system **10** can have first and second catalytic heaters **58***a* and **58***b*. The multiple bays **66** allows the FGR system **10** to be configured with a desired number of catalytic heaters **58** to match a size of the wellhead and/or an anticipated flow of fugitive gas. The number of catalytic heaters **58** can be varied in accordance with the requirement of the site, or the amount of vent gas. In one aspect, the panel **62** can have two bays **66** with two catalytic heaters **58***a* and **58***b*. In another aspect, the panel **62** can have four bays **66**. In one aspect, the catalytic heaters **58** can be selectively operated to match the flow of fugitive gas. Pressure regulators and valves can be coupled to the pipe system **70** between the separator **54** and the catalytic heaters **58**.

[0025] The FGR system **10** can also have a pipe system **70** interconnecting the catalytic heater **58**, the separator **54**, the inlet **46**, and the pilot gas inlet **50**. The pipe system **70** includes valves (e.g. needle valves, ball valves and solenoid valves), gauges (e.g. pressure and temperature gauges), sensors (e.g. pressure and temperature transducer) and regulators. The pipe system **70** is located in the enclosure **18** and the skid **22**. In one aspect, a majority of the pipe system **70** can be positioned at one side of the enclosure **18** and the skid **22**, along with the separator **54**, opposite the catalytic heater **58**. In one aspect, the majority of the pipe system **70** can be greater than half of the pipe system. In another aspect, the majority of the pipe system **70** can be a super majority.

[0026] The enclosure **18** and the skid **22** can carry, surround and enclose the separator **54**, the catalytic heater **58**, and the pipe system **70**. Thus, the catalytic heater **58** can heat the separator **54** and the pipe system **70**. The inlet **46** and the pilot gas inlet **50** can be coupled to the separator **54** and the catalytic heater **58**. In one aspect, both the pilot gas and the fugitive gas can be directed to and through the separator **54**, with both pilot gas and fugitive gas directed from the separator **54** to the catalytic heater **58**. Solenoid valves can be disposed in the pilot gas line and the fugitive gas line, between the inlet **46** and the pilot gas inlet **70** and the separator **54**, to control flow.

[0027] In another aspect, the catalytic heater **58** and the panel **62** can be movably and selectively positioned with respect to the separator **54** and the pipe system **58**. In one aspect, an array of sockets **74** can be carried by the floor **26** of the enclosure **18** and the skid **22**. The array **74** can extend in a direction in varying proximity to the separator **54** and the pipe system **70**. The panel **62** can have legs or posts that are selectively received is a set of the array of sockets **74** in a predetermined proximity to the separator **54** and the pipe system **70**. Thus, the catalytic heater **58** can be selectively located in proximity with respect to the separator **54** and the pipe system **70**. For example, the panel **62** and the catalytic heater **58** can be positioned closer to the separator **54** and the pipe system **70** in colder climates and seasons, and farther during in warmer climates and seasons.

[0028] The FGR system **10** and the skid **22** can have the enclosure **18** surrounding the skid **22** and carried by the skid **22** so that the separator **54**, the catalytic heater **58**, and the piping system **70** are enclosed in the skid **22**. Thus, the heat from the catalytic heater **58** can be maintained in the skid **22** and the enclosure **18** to avoid freeze-up of the pipe system **70** and the separator **54** in colder climates and seasons. The enclosure **18** and the skid **22** can have a vent **42**, such as a roof vent, carried by the enclosure **18** to allow air into the enclosure **18** and the skid **22** for combustion by the catalytic heater **58**.

[0029] The FGR system **10** and the skid **22** can also have a control system coupled to some of the valves, gauges and sensors and selectively controlling the valves to allow vent gas, and/or pilot gas, into the separator **54**, and from the separator **54** to the catalytic heater **58**.

[0030] The FGR system **10** can also have a flow meter **80** to measure a flow rate of fugitive gas from the fugitive gas source. Thus, the system **10** can both monitor and eliminate fugitive gas. In one aspect, the flow meter **80** can be a VentSentinal® from VentBuster Instruments Inc. In another aspect, the flow meter **80** can be associated with the enclosure **18** and the skid **22**. For example, the flow meter **80** can be carried by the enclosure **18** and the skid **22**. The flow meter **80** can be located in the enclosure **18** along with the pipe system **70**.

[0031] A transmitter **84** can be associated with the flow meter **80** to transmit a signal carrying the flow rate measured by the flow meter **80**. The transmitter **84** can be mounted to and carried by the flow meter **80**. The transmitter **84** can be associated with, carried by, and/or located in the enclosure **18** along with the flow meter **80**. The flow rate and/or data measured by the flow meter **80** and transmitted by the transmitter **84** can be monitored, saved and/or reported for compliance.

[0032] A water knockout **88** can be associated with the enclosure **18** and coupled to the fugitive gas source. The water knockout **88** can be located upstream of the flow meter **80**. The water meter **80** can be coupled to the fugitive gas source downstream of the water knockout **88**. In one aspect, the water knockout **88** can be associated with, carried by, and/or located in the enclosure **18**.

[0033] In another aspect, the water knockout **88**, the flow meter **80** and the transmitter **84** can be located upstream of the enclosure **18**.

[0034] An igniter **92** can be positioned proximate the second catalytic heater **58***b* and operatively coupled to the transmitter **84**. The igniter **92** can be configured to ignite when the flow rate exceeds a predetermined threshold. Thus, during higher flow, the second catalytic heater **58***b* can be automatically ignited.

[0035] A control valve **96** can be associated with the second catalytic heater **58***b* and coupled between the separator **54** and the second catalytic heater **58***b*. The control valve **96** can be operatively coupled to the transmitter **84** and configured to open when the flow rate exceeds a predetermined threshold. Thus, during higher flow, the second catalytic heater **58***b* can be fed excess gas.

[0036] In one aspect, the igniter **92** and the control valve **96** can work together.

[0037] A method for monitoring and eliminating casing vent gas from a wellhead, and for using the FGR system **10** as described above, can comprise: [0038] 1) positioning the enclosure **18** and the skid **22** adjacent to the wellhead; [0039] 2) connecting the enclosure **18** and the skid **22** to a valve atop the wellhead to receive the casing vent gas from the wellhead and transport the casing vent gas into the enclosure **18** and the skid **22**; [0040] 4) removing liquids from the casing vent gas with the separator **54** disposed in the skid **22**; [0041] 5) reacting with the casing vent gas in the catalytic heater **58** and heating the enclosure **18** and the skid **22** with heat from the reaction of the casing vent gas; [0042] 6) measuring gas flow with the flow meter **80**; and [0043] 7) transmitting the gas flow with the transmitter **84**.

[0044] In addition, supplemental pilot gas can be provided to the catalytic heater **58** as needed. Furthermore, the catalytic heater **58** can be selectively positioned in proximity to the separator **54** and the pipe system **70**.

[0045] Referring to FIGS. **8-11**, another FGR system **110** in accordance with another embodiment is shown, and which is similar in many respects to that described above, and which description is incorporated herein by reference. The following description can apply to the preceding description as well. The enclosure **118** can be elevated above the ground by a plinth **202** and a column **206**. The plinth **202** can be positioned over a support surface, such as the ground adjacent a wellhead. The plinth **202** can have a size at least as great as a lateral size of the enclosure **118** to resist tipping. The column **206** can be carried by the plinth **202**. The enclosure **118** is carried by the column **206** and elevated over the plinth **202**. A lower end of the column **206** can be attached to the plinth **202**, while an upper end of the column **206** can be coupled to a bottom of the separator **54**.

[0046] The enclosure **118** can have a matrix of apertures therein, but still be a substantial enclosure. In one aspect, the enclosure **118** can comprise or can be a clamshell **122** with a pair of portions or shells movably coupled together. In another aspect, the portions or shells can be pivotally coupled together by a hinge **210** and pivotal with respect to one another. One stationary portion or shell can be stationary and secured to the column **206**, while the other movable portion or shell can be movable and can pivot with respect to the stationary portion. In addition, the stationary portion or shell can carry and substantially contain the separator **54** and the pipe system **70**, while the movable portion or shell can carry and substantially contain the catalytic heater **58**. Thus, the catalytic heater **58** can move and pivot with the movable portion or shell with respect to the separator **54** and the pipe system **70**.

[0047] In one aspect, the separator **54** can be mounted on the column **206**, and can form a portion of the column. A bottom of the stationary portion or shell can be coupled to the column **206** under the separator **54**, while a top of the stationary portion or shell can be coupled to a top of the separator **54**.

[0048] As described above, the separator **54** can separate fluid from the gas, and can contain the removed fluid for later disposal. The separator **54** can have a high fluid shutdown **224** to sense a volume of the separator and stop the flow of gas and shutdown down the operation of the FGR system **110** in the event that the fluid volume exceeds a safe level. The shutdown **224** can comprise a mechanical float located near a top of the separator **54**.

[0049] The FGR system **110** and the pipe system **70** can comprise a Bradenhead high-pressure regulator **232** coupled to the inlet **46** to receive Bradenhead gas from the fugitive gas source. The high-pressure regulator **232** can have a working pressure of 5,000 psi, and can manage Bradenhead supply and operating pressure of the FGR system **110**. In addition, a high-pressure in-line filter **240** can be coupled to the high-pressure regulator **232**. Supply lines, also rated at 5,000 psi, can be coupled to the high-pressure in-line filter **240** and the high-pressure regulator **232**.

[0050] The FGR system **110** and the pipe system **70** can comprise a low-pressure Bradenhead regulator **248** and a low-pressure pilot gas regulator **252**. The low-pressure Bradenhead regulator **248** manages Bradenhead supply pressure and flow to the catalytic heater **58**. The low-pressure pilot gas regulator **252** manages pilot gas supply pressure and flow to the catalytic heater **58**, and ensures continuous operation of the catalytic heater **58** in the event that Bradenhead gas is insufficient.

[0051] As used in this specification and the appended claims, the singular forms “a,” “an” and “the” include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to “a layer” includes a plurality of such layers.

[0052] In this disclosure, “comprises,” “comprising,” “containing” and “having” and the like can have the meaning ascribed to them in U.S. Patent law and can mean “includes,” “including,” and the like, and are generally interpreted to be open ended terms. The terms “consisting of” or “consists of” are closed terms, and include only the components, structures, steps, or the like specifically listed in conjunction with such terms, as well as that which is in accordance with U.S. Patent law. “Consisting essentially of” or “consists essentially of” have the meaning generally ascribed to them by U.S. Patent law. In particular, such terms are generally closed terms, with the exception of allowing inclusion of additional items, materials, components, steps, or elements, that do not materially affect the basic and novel characteristics or function of the item(s) used in connection therewith. For example, trace elements present in a composition, but not affecting the composition's nature or characteristics would be permissible if present under the “consisting essentially of” language, even though not expressly recited in a list of items following such terminology. When using an open ended term in the specification, like “comprising” or “including,” it is understood that direct support should be afforded also to “consisting essentially of" language as well as "consisting of" language as if stated explicitly and vice versa.

[0053] The terms "first," "second," "third," "fourth," and the like in the description and in the claims, if any, are used for distinguishing between similar elements and not necessarily for describing a particular sequential or chronological order. It is to be understood that the terms so used are interchangeable under appropriate circumstances such that the embodiments described herein are, for example, capable of operation in sequences other than those illustrated or otherwise described herein. Similarly, if a method is described herein as comprising a series of steps, the order of such steps as presented herein is not necessarily the only order in which such steps may be performed, and certain of the stated steps may possibly be omitted and/or certain other steps not described herein may possibly be added to the method.

[0054] The terms "left," "right," "front," "back," "top," "bottom," "over," "under," and the like in the description and in the claims, if any, are used for descriptive purposes and not necessarily for describing permanent relative positions. It is to be understood that the terms so used are interchangeable under appropriate circumstances such that the embodiments described herein are, for example, capable of operation in other orientations than those illustrated or otherwise described herein.

[0055] The term "coupled," as used herein, is defined as directly or indirectly connected in an electrical or nonelectrical manner. Objects described herein as being "adjacent to" each other may be in physical contact with each other, in close proximity to each other, or in the same general region or area as each other, as appropriate for the context in which the phrase is used. Occurrences of the phrase "in one embodiment," or "in one aspect," herein do not necessarily all refer to the same embodiment or aspect.

[0056] As used herein, the term "substantially" refers to the complete or nearly complete extent or degree of an action, characteristic, property, state, structure, item, or result. For example, an object that is "substantially" enclosed would mean that the object is either completely enclosed or nearly completely enclosed. The exact allowable degree of deviation from absolute completeness may in some cases depend on the specific context. However, generally speaking the nearness of completion will be so as to have the same overall result as if absolute and total completion were obtained. The use of "substantially" is equally applicable when used in a negative connotation to refer to the complete or near complete lack of an action, characteristic, property, state, structure, item, or result. For example, a composition that is "substantially free of" particles would either completely lack particles, or so nearly completely lack particles that the effect would be the same as if it completely lacked particles. In other words, a composition that is "substantially free of" an ingredient or element may still actually contain such item as long as there is no measurable effect thereof.

[0057] As used herein, "adjacent" refers to the proximity of two structures or elements. Particularly, elements that are identified as being "adjacent" may be either abutting or connected. Such elements may also be near or close to each other without necessarily contacting each other. The exact degree of proximity may in some cases depend on the specific context.

[0058] As used herein, the term "about" is used to provide flexibility to a numerical range endpoint by providing that a given value may be "a little above" or "a little below" the endpoint. It is understood that express support is intended for exact numerical values in this specification, even when the term "about" is used in connection therewith.

[0059] It is to be understood that the examples set forth herein are not limited to the particular structures, process steps, or materials disclosed, but are extended to equivalents thereof as would be recognized by those ordinarily skilled in the relevant arts. It should also be understood that terminology employed herein is used for the purpose of describing particular examples only and is not intended to be limiting.

[0060] Furthermore, the described features, structures, or characteristics may be combined in any suitable manner in one or more examples. In the description, numerous specific details are provided, such as examples of lengths, widths, shapes, etc., to provide a thorough understanding of the technology being described. One skilled in the relevant art will recognize, however, that the invention can be practiced without one or more of the specific details, or with other methods, components, materials, etc. In other instances, well-known structures, materials, or operations are not shown or described in detail to avoid obscuring aspects of the invention.

[0061] While the foregoing examples are illustrative of the principles of the invention in one or more particular applications, it will be apparent to those of ordinary skill in the art that numerous modifications in form, usage and details of implementation can be made without the exercise of inventive faculty, and without departing from the principles and concepts described herein. Accordingly, it is not intended that the invention be limited, except as by the claims set forth below.

Claims

1. A fugitive gas remediation (FGR) system configured to monitor and eliminate fugitive gas at a site with a fugitive gas source, the FGR system comprising: a) an enclosure configured to be positionable at the site with the fugitive gas source; b) an inlet carried by the enclosure and configured to be coupled to the fugitive gas source; c) a separator located in the enclosure and coupled to the inlet and configured to remove liquid from the fugitive gas; d) a catalytic heater located in the enclosure and coupled to the separator and configured to react with the fugitive gas and produce heat in the enclosure; e) a water knockout associated with the enclosure and configured to be coupled to the fugitive gas source; f) a flow meter associated with the enclosure and configured to be coupled to the fugitive gas source downstream of the water knockout, the flow meter configured to measure a flow rate of fugitive gas from the fugitive gas source; and g) a transmitter associated with the flow meter and configured to transmit a signal carrying the flow rate measured by the flow meter.

2. The FGR system of claim 1, wherein the water knockout, the flow meter and the transmitter are carried by the enclosure.

3. The FGR system of claim 2, wherein the water knockout, the flow meter and the transmitter are located in the enclosure.

4. The FGR system of claim 1, further comprising: the catalytic heater comprising first and second catalytic heaters; and an igniter positioned proximate the second catalytic heater and operatively coupled to the transmitter; and wherein the igniter is configured to ignite when the flow rate exceeds a predetermined threshold.

5. The FGR system of claim 1, further comprising: the catalytic heater comprising first and second catalytic heaters; and a control valve associated with the second catalytic heater, coupled between the separator and the second catalytic heater, and operatively coupled to the transmitter; and wherein the control valve is configured to open when the flow rate exceeds a predetermined threshold.

6. The FGR system of claim 1, wherein the water knockout, the flow meter and the transmitter are located upstream of the enclosure.

7. The FGR system of claim 1, further comprising: the separator being positioned at one side of the enclosure, opposite the catalytic heater.

8. The FGR system of claim 7, further comprising: the catalytic heater being positioned on an opposite side of the enclosure from the separator; and the catalytic heater being movably positioned with respect to the separator.

9. The FGR system of claim 1, further comprising: a pipe system located in the enclosure and comprising valves, gauges and sensors, and interconnecting the catalytic heater and the separator; and the enclosure surrounding and enclosing the separator, the catalytic heater, and the pipe system.

10. The FGR system of claim 9, further comprising: a majority of the pipe system being positioned at one side of the enclosure, opposite the catalytic heater.

11. The FGR system of claim 9, further comprising: the catalytic heater being positioned on an opposite side of the enclosure from the majority of the pipe system; and the catalytic heater being movably positioned with respect to the pipe system.
12. The FGR system of claim 1, further comprising: a pilot gas inlet carried by the enclosure and configured to be coupled to a pilot gas source; and the pilot gas inlet being coupled to the catalytic heater.
13. The FGR system of claim 1, further comprising: the enclosure comprising a mobile skid; the mobile skid configured to be deliverable to the site with the fugitive gas source; and the mobile skid carrying the separator and the catalytic heater.
14. The FGR system of claim 13, further comprising: eyelets secured to the mobile skid configured to allow the mobile skid to be lifted.
15. The FGR system of claim 1, further comprising: the enclosure comprising a clamshell with portions movably coupled with respect to one another; and the catalytic heater carried by one portion of the clamshell and movable with the one portion of the clamshell with respect to the other portion of the clamshell.
16. The FGR system of claim 1, further comprising: a plinth positioned over a support surface; a column carried by the plinth; and the enclosure carried by the column and elevated over the plinth.
17. The FGR system of claim 16, further comprising: the separator forming a portion of the column; and the enclosure comprising a clamshell with a stationary portion of the clamshell carried by the column and the separator, and a pivotal portion of the clamshell carrying the catalytic heater.
18. The FGR system of claim 1, further comprising: a pipe system comprising valves, gauges and sensors, and interconnecting the catalytic heater and the separator; and a control system coupled to some of the valves, gauges and sensors and selectively controlling the valves to allow vent gas into the separator, and from the separator to the catalytic heater.
19. A fugitive gas remediation (FGR) system configured to monitor and eliminate casing vent gas from a wellhead, the FGR system comprising: a) an enclosure configured to be positioned at a well site adjacent the wellhead; b) an inlet carried by the enclosure and configured to be coupled to a valve of the wellhead; c) a separator located in the enclosure and coupled to the inlet and configured to remove liquid from the casing vent gas; d) a catalytic heater located in the enclosure and coupled to the separator and configured to react with the casing vent gas and produce heat in the enclosure; e) a pipe system located in the enclosure and comprising valves, gauges and sensors, and interconnecting the catalytic heater and the separator; f) the catalytic heater being positioned on an opposite side of the enclosure from the separator and a majority of the pipe system; g) the enclosure surrounding and enclosing the separator, the catalytic heater, and the pipe system; h) a flow meter carried by the enclosure and configured to be coupled to the fugitive gas source, the flow meter configured to measure a flow rate of fugitive gas from the wellhead; and i) a transmitter carried by the enclosure and operatively coupled to the flow meter, the transmitter configured to transmit a signal carrying the flow rate.
20. A fugitive gas remediation (FGR) system configured to monitor and eliminate casing vent gas from a wellhead, the FGR system comprising: a) an enclosure configured to be positioned at a well site adjacent the wellhead; b) an inlet carried by the enclosure and configured to be coupled to a valve of the wellhead; c) a separator located in the enclosure and coupled to the inlet and configured to remove liquid from the casing vent gas; d) a catalytic heater located in the enclosure and coupled to the separator and configured to react with the casing vent gas and produce heat in the enclosure; e) a pipe system located in the enclosure and comprising valves, gauges and sensors, and interconnecting the catalytic heater and the separator; f) the catalytic heater being positioned on an opposite side of the enclosure from the separator and a majority of the pipe system; g) the enclosure surrounding and enclosing the separator, the catalytic heater, and the pipe system; h) the catalytic heater being movably positioned with respect to the separator and the majority of the pipe system; i) a flow meter carried by the enclosure and coupled to the fugitive gas source, the flow

meter configured to measure a flow rate of fugitive gas from the wellhead; and j) a transmitter carried by the enclosure and operatively coupled to the flow meter, the transmitter configured to transmit a signal carrying the flow rate.