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(54) **CONTROLLING FLUID FLOWS IN A MULTI-WELLBORE WELL SYSTEM WITH A SURFACE CONTROLLED FORMATION ISOLATION VALVE**

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None
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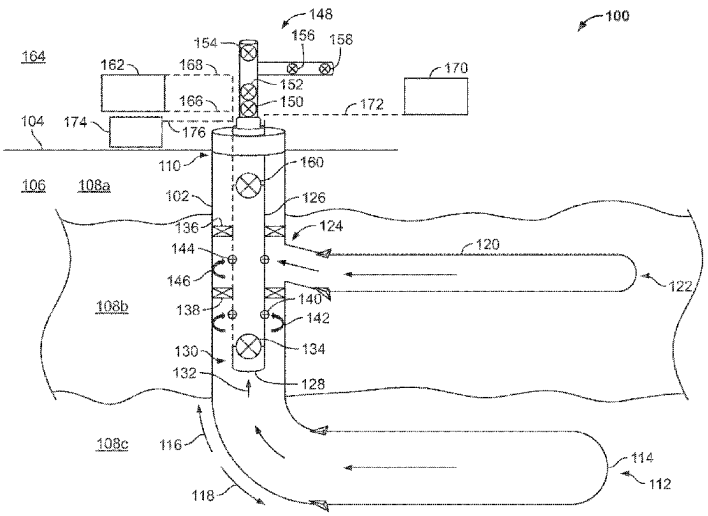
(57) **ABSTRACT**

A method and systems controlling fluid flow in a multi-wellbore well system with a surface controlled formation isolation valve in a well system requiring an intervention job. The method includes transmitting, from a control panel on a surface of the Earth, the control panel operatively coupled to the well system, a control signal to a surface controlled formation isolation valve positioned in the well system at a downhole location and configured to control a fluid flow from a motherbore into a production tubing. The method includes receiving, at the surface controlled formation isolation valve, the control signal. The method includes after receiving the control signal at the surface controlled formation isolation valve, opening the surface controlled formation isolation valve hydraulically. The method includes after opening the surface controlled formation isolation valve, the required intervention job can be conducted.

24 Claims, 2 Drawing Sheets



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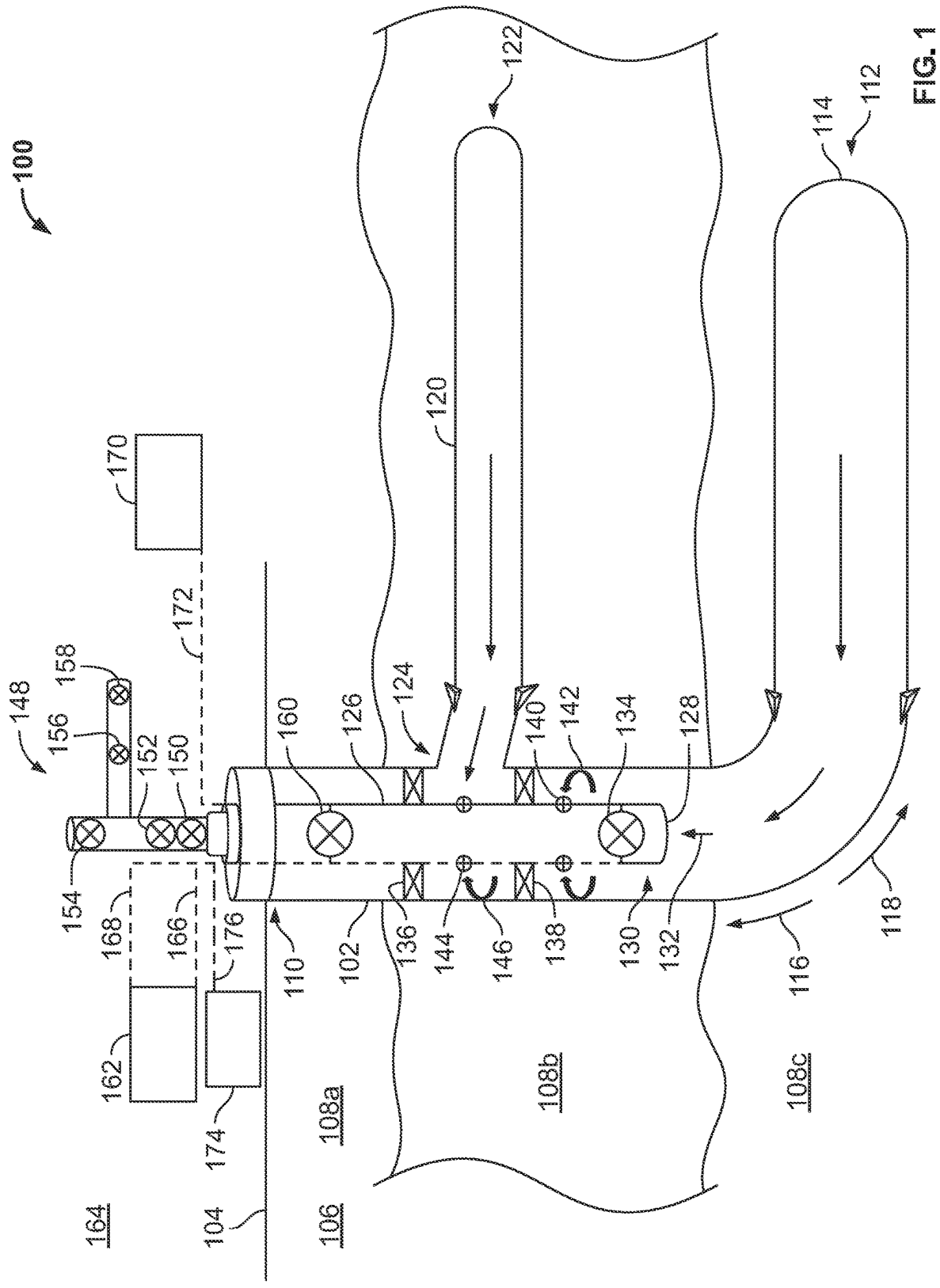
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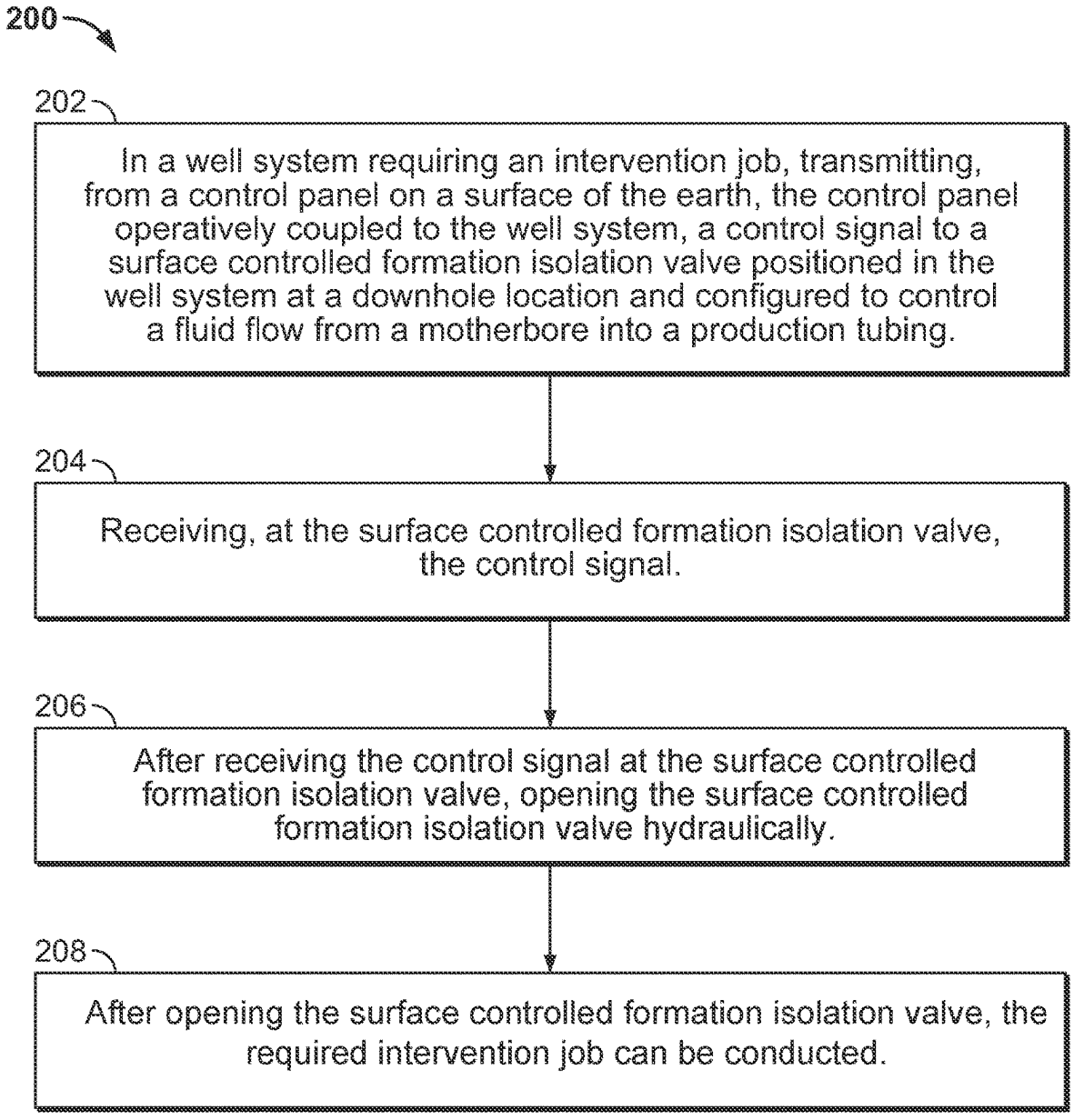
FIG. 1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In a well system requiring an intervention job, transmitting, from a control panel on a surface of the earth, the control panel operatively coupled to the well system, a control signal to a surface controlled formation isolation valve positioned in the well system at a downhole location and configured to control a fluid flow from a motherbore into a production tubing.
204
Receiving, at the surface controlled formation isolation valve, the control signal.
206
After receiving the control signal at the surface controlled formation isolation valve, opening the surface controlled formation isolation valve hydraulically.
208
After opening the surface controlled formation isolation valve, the required intervention job can be conducted.

FIG. 2

CONTROLLING FLUID FLOWS IN A MULTI-WELLBORE WELL SYSTEM WITH A SURFACE CONTROLLED FORMATION ISOLATION VALVE

TECHNICAL FIELD

This disclosure relates to multi-wellbore flow control operation.

BACKGROUND

Wellbores in an oil and gas well conduct liquid and gaseous phases of various fluids and chemicals including water, oils, and hydrocarbon gases from subterranean formations to a surface of the Earth. The fluids and gases in the wellbore can be pressurized. A wellbore pressure control system is installed on the wellbore to seal the wellbore and to control the flow of oil and gas from the wellbore. The wellbore pressure control system can include inflow control valves to control the flow of oil and gas by forcing the flow of oil and gas from the wellbore to the inflow control valves.

SUMMARY

This disclosure describes systems and methods related to controlling fluid flow in a multi-wellbore well system with a surface controlled formation isolation valve. This approach controls fluid flow in a multi-wellbore well system with a surface controlled formation isolation valve in a well system requiring an intervention job.

In one aspect, the method includes transmitting, from a control panel on a surface of the Earth, the control panel operatively coupled to the well system, a control signal to a surface controlled formation isolation valve positioned in the well system at a downhole location to control a fluid flow from a motherbore into a production tubing. The method includes receiving, at the surface controlled formation isolation valve, the control signal. The method includes operating, based on the control signal, the surface controlled formation isolation valve to control the fluid flow from the motherbore into the production tubing. The method includes performing the intervention job on the well system.

In some implementations, transmitting the control signal to the surface controlled formation isolation valve includes conducting the control signal via a surface controlled formation isolation valve control line electrically coupling the control panel to the surface controlled formation isolation valve.

In some implementations, the control signal includes at least one of an open control signal or a close control signal. In some cases, operating the surface controlled formation isolation valve responsive to receiving the open control signal at the surface controlled formation isolation valve includes opening the surface controlled formation isolation valve.

In some implementations, the method further includes, responsive to opening the surface controlled formation isolation valve, conducting a flow of the fluid from the at least one of multiple subterranean formations of the Earth through the motherbore into the production tubing positioned in the motherbore. The production tubing fluidly couples the motherbore to a wellhead positioned on the surface. In some cases, operating the surface controlled formation isolation valve responsive to receiving the close control signal at the surface controlled formation isolation valve includes closing the surface controlled formation isolation valve.

In some implementations, the method further includes responsive to closing the surface controlled formation isolation valve, stopping a flow of fluid from the at least one of the subterranean formations through the motherbore into the production tubing. In some cases, when the surface controlled formation isolation valve is closed, method the further includes operating a motherbore inflow control valve positioned in the motherbore to control the flow of the fluid from the motherbore into the production tubing and operating a lateral inflow control valve positioned in the motherbore to control a flow of another fluid from the lateral wellbore into the production tubing.

In some implementations, the method further includes transmitting, from a single well completion panel positioned at the surface of the Earth, the single well completion panel operatively coupled to the motherbore inflow control valve and the lateral inflow control valve, another control signal via an inflow control valve line to the motherbore inflow control valve and the lateral inflow control valve to operate the motherbore inflow control valve and the lateral inflow control valve. The method further includes receiving, at the motherbore inflow control valve and the lateral inflow control valve via an inflow control valve line to the motherbore inflow control valve and the lateral inflow control valve, the another control signal.

In some implementations, the method further includes sensing a safety condition in the motherbore; and responsive to sensing the safety condition in a portion of the motherbore, operating via the control panel, a sub-surface safety valve positioned in the motherbore to isolate the motherbore.

In another aspect, a well system includes a motherbore, a lateral wellbore fluidly coupled to the motherbore, a surface controlled formation isolation valve, and a control panel. The motherbore extends from a surface of the Earth into multiple subterranean formations. The motherbore is fluidly coupled to at least one of the subterranean formations to receive a fluid from at least one of the subterranean formations. The lateral wellbore extends from the motherbore at a location between the downhole end of the motherbore and the surface. The lateral wellbore is fluidly coupled to at least another one of the multiple subterranean formations to receive another fluid from the at least another one of the subterranean formations. The surface controlled formation isolation valve is positioned in the motherbore to control a fluid flow from the motherbore into the production tubing. The control panel is positioned in a space above the surface. The control panel is operatively coupled to the well system and the surface controlled formation isolation valve.

In some implementations, the control panel performs operations including transmitting the control signal to the surface controlled formation isolation valve.

In some implementations, the well system further includes a surface controlled formation isolation valve control line electrically coupling the control panel to the surface controlled formation isolation valve. The surface controlled formation isolation valve control line conducts the control signal from the control panel to the surface controlled formation isolation valve. In some cases, the surface controlled formation isolation valve control line can be a hydraulic control line hydraulically coupling the control panel to the surface controlled formation isolation valve. The surface controlled formation isolation valve hydraulic control line conducts hydraulic fluid from the control panel to the surface controlled formation isolation valve as a hydraulic control signal to hydraulically open and close the surface controlled formation isolation valve.

In some implementations, the control signal includes at least one of an open control signal or a close control signal.

In some implementations, the well system further includes a production tubing positioned in the motherbore. The production tubing extends from the surface through the motherbore to a location downhole from the lateral wellbore. In some cases, the well system further includes a wellhead assembly coupled to the motherbore at the surface. The wellhead assembly controls the fluid flow from the motherbore.

In some cases, the well system further includes a first packer and a second packer. The first packer is positioned in the motherbore uphole from the lateral wellbore. The second packer is positioned in the motherbore downhole from the lateral wellbore and uphole from the surface controlled formation isolation valve.

In some implementations, the well system further includes a motherbore inflow control valve and a lateral inflow control valve. The motherbore inflow control valve is coupled to the production tubing and positioned in the motherbore uphole of the surface controlled formation isolation valve and downhole of the second packer. The motherbore inflow control valve controls the fluid flow from the motherbore into the production tubing. The lateral inflow control valve is coupled to the production tubing and positioned in the motherbore between the first packer and the second packer. The lateral inflow control valve controls the flow of the another fluid from the lateral wellbore into the production tubing. In some cases, the well system, further includes a single well completion panel and an inflow control valve line. The single well completion panel is positioned in the space outside the wellbore. The single well completion panel is operatively coupled to the motherbore inflow control valve and the lateral inflow control valve. The inflow control valve line operatively couples the single well completion panel to the motherbore inflow control valve and the lateral inflow control valve.

In some implementations, the well system further includes a sub-surface safety valve positioned in the motherbore to isolate a portion of motherbore from the space outside the well system.

In some implementations, the well system further includes an emergency shutdown system coupled to the surface controlled formation isolation valve. The emergency shutdown system hydraulically operates the surface controlled formation isolation valve.

Implementations of the present disclosure can realize one or more of the following advantages. These systems and methods can decrease total wellbore maintenance time. For example, conventionally, production of the wellbore is secured, a workover rig is positioned above the wellbore, and a shifting tool is deployed into the wellbore to reposition the formation isolation valve. These operations can be time-consuming. Opening and closing the formation isolation valve remotely from a controller on the surface can eliminate securing production of the wellbore, positioning the workover rig, and deploying the shifting tool, which can reduce the time required for wellbore maintenance.

These systems and methods can improve personnel safety. For example, eliminating positioning the workover rig, and deploying the shifting tool, which can be dangerous operations to personnel, can improve personnel safety. In addition, mechanical formation isolation valve shifting operations can be performed offshore without a drilling rig, utilizing a barge, which can be a costly operation.

These systems can eliminate using a rig to shift a mechanical formation isolation valve. For example, a surface control panel can be utilized with rig-less operations and without additional field services personnel. Eliminating using a rig and additional field service personnel can eliminate the cost associated with running coiled tubing operations to shift the mechanical formation isolation valve from a closed position to an open position. Eliminating using a rig and additional field service personnel can, in effect, reduce man-hours exposure to hazardous critical operations and maintain wellbore accessibility as per engineering needs.

The details of one or more implementations of the subject matter described in this disclosure are set forth in the accompanying drawings and the description below. Other features, aspects, and advantages of the subject matter will become apparent from the description, the drawings, and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic view of a multi-wellbore well system having a surface controlled formation isolation valve.

FIG. **2** is a flow chart of an example method of controlling fluid flow in a multi-wellbore well system with a surface controlled formation isolation valve according to implementations of the present disclosure.

DETAILED DESCRIPTION

An oil and gas well has a wellbore extending from a surface of the Earth to subterranean formations in the Earth. The subterranean formations contain liquid and gaseous phases of various fluids and chemicals including water, oils, and hydrocarbon gases. The wellbore conducts the fluids and chemicals from the subterranean formations to the surface. A wellhead, formation isolation valves, inflow control valves, sub-surface safety valves, and wellhead control valves can be installed on the wellbore to seal the wellbore and to control the flow of oil and gas from the wellbore. After completing a wellbore, the formation isolation valves can be placed in a closed position forcing the liquids and gases to flow from the wellbore through the inflow control valves into a production tubing extending to the wellhead. Sometimes, the formation isolation valve needs to be opened. Opening the formation isolation valve requires stopping flowing the liquids and gases from the wellbore and deploying a shifting tool into the wellbore to the formation isolation valve to operate the formation isolation valve. For example, a coiled tubing assembly can deploy the shifting tool from the workover rig into the wellbore to actuate the formation isolation valve.

The present disclosure relates to controlling fluid flow in a multi-wellbore well system with a surface controlled formation isolation valve. In a well system requiring an intervention job, this approach controls fluid flow in the multi-wellbore well system with the surface controlled formation isolation valve controlled from a surface control panel. A control signal is transmitted from the control panel on a surface of the Earth to the surface controlled formation isolation valve positioned in the well system at a downhole location in the multi-wellbore well system. The surface controlled formation isolation valve controls a fluid flow from a motherbore into a production tubing of the well system. The surface controlled formation isolation valve receives the control signal. Based on the control signal, the surface controlled formation isolation valve operates to

control the fluid flow from the motherbore into the production tubing. The intervention job is performed on the well system.

Well intervention operations (intervention jobs) are contingent to engineering analysis results of the downhole production performance. These requirements for an intervention job can arise after noticing production performance changes, introduction of water production due to prolonged production duration throughout the life of the well, and/or production enhancement treatments which require accessing the wellbore and removing all downhole restriction limiting achieving the desired depth. The intervention jobs that require full wellbore accessibility can be deployed through coiled tubing. This includes an array of well intervention operations including, but not limited to, running array production logging tools to profile downhole contribution of the wellbore beyond the production tubing depth, lifting the well with nitrogen for wellbore cleanup, treating the reservoir with acidization to enhance production performance, and running and installing downhole plugs to isolate undesired production of water or gas.

FIG. **1** is a schematic view of a multi-wellbore well system having a surface controlled formation isolation valve. The multi-wellbore well system **100** has a motherbore **102** extending from a surface **104** of the Earth **106**. The Earth **106** has multiple subterranean formations: a first subterranean formation **108***a*, a second subterranean formation **108***b*, and third subterranean formation **108***c* which can contain liquid and gaseous phases of various fluids and chemicals including water, oils, and hydrocarbon gases. The motherbore **102** receives the fluids from the third subterranean formation **108***c* and conducts the fluids to the surface **104**. The motherbore **102** has an uphole end **110** and a downhole end **112**. The uphole end **110** of the motherbore **102** is coupled to the surface **104** and the downhole end **112** is at a bottom hole surface **114** which is located in the third subterranean formation **108***c*. The fluids flow from the third subterranean formation **108***c* into the motherbore **102** and through the motherbore **102** in an uphole direction shown by arrow **116**. The uphole direction **116** is from the downhole end **112** toward the uphole end **110**. A downhole direction is shown by arrow **118**. The downhole direction **118** is from the uphole end **110** toward the downhole end **112**.

The multi-wellbore well system **100** has a lateral wellbore **120** coupled to and extending from the motherbore **102**. The lateral wellbore **120** is coupled to the motherbore **102** in the uphole direction **116** from the downhole end **112** of the motherbore **102**. The lateral wellbore **120** is positioned in the second subterranean formation **108***b*. The lateral wellbore **120** receives the fluids from the second subterranean formation **108***b* and conducts the fluids to the motherbore **102**. The lateral wellbore **120** has a downhole end **122** and an uphole end **124**. The uphole end **124** of the lateral wellbore **120** is coupled to the motherbore **102**.

The multi-wellbore well system **100** includes a production tubing **126** positioned in the motherbore **102** and extending from the surface **104** to conduct the various fluids from the motherbore **102** and the lateral wellbore **120** to the surface **104**. The production tubing **126** has an opening **128** at a downhole end **130** of the production tubing **126**. The fluids from the third subterranean formation **108***c* flow through the opening **128** in the direction of arrow **132** into the production tubing **126**.

The multi-wellbore well system **100** includes a first packer **136** and a second packer **138** coupled between the production tubing **126** and the motherbore **102** sealing the production tubing **126** to the motherbore **102**. The first packer **136** is positioned in the motherbore **102** in the uphole direction **116** from the lateral wellbore **120**. The second packer **138** is positioned in the motherbore **102** in the downhole direction **118** from the lateral wellbore **120** and in the uphole direction **116** from the downhole end **130** of the production tubing **126**. The first packer **136** and the second packer **138** direct the fluid from the lateral wellbore **120** (the fluid from the second subterranean formation **108***b*) into the production tubing **126** and prevent the fluid from flowing into the motherbore **102** in the downhole direction **118**.

The multi-wellbore well system **100** includes a motherbore inflow control valve **140** coupled to the production tubing **126** and positioned in the motherbore **102** in the uphole direction **116** of the opening **128** of the production tubing **126** and in the downhole direction **118** from the second packer **138** to control the fluid flow from the motherbore **102** into the production tubing **126**. The motherbore inflow control valve **140** can actuate between an open position allowing fluid flow from the motherbore **102** into the production tubing **126**, a partially open position (a partially closed position) throttling fluid flow from the motherbore **102** into the production tubing **126**, and a closed position preventing fluid flow from the motherbore **102** into the production tubing **126**. The fluids from the motherbore **102** flow through the motherbore inflow control valve **140** in the direction of arrows **142** into the production tubing **126**.

The multi-wellbore well system **100** includes a lateral inflow control valve **144** coupled to the production tubing **126** and positioned in the motherbore **102** in the uphole direction **116** from the second packer **138** and in the downhole direction **118** from the first packer **136** to control the fluid flow from the lateral wellbore **120** into the production tubing **126**. The lateral inflow control valve **144** can actuate between an open position allowing fluid flow from the lateral wellbore **120** into the production tubing **126**, a partially open position (a partially closed position) throttling fluid flow from the lateral wellbore **120** into the production tubing **126**, and a closed position preventing fluid flow from the lateral wellbore **120** into the production tubing **126**. The fluids from the lateral wellbore **120** flow through the lateral inflow control valve **144** in the direction of arrows **146** into the production tubing **126**.

The multi-wellbore well system **100** includes a wellhead assembly **148** coupled to the motherbore **102** and the production tubing **126** at the surface **104** to seal the motherbore **102** and control the fluids flowing from the production tubing **126**. The wellhead assembly **148** has a lower master valve **150** and an upper master valve **152** coupled to the lower master valve **150** to control the flow of fluids from the production tubing **126**. The wellhead assembly **148** has a crown valve **154** to allow access to the motherbore **102** and the production tubing **126** through the wellhead assembly **148**. The wellhead assembly **148** has a wing valve **156** and a choke valve **158** to control the fluid flow to a production or storage facility (not shown).

The multi-wellbore well system **100** includes a sub-surface safety valve **160** positioned in the production tubing **126** as a backup to stop the flow of fluid from the production tubing **126** to the surface **104**. The sub-surface safety valve **160** is positioned in the uphole direction **116** from the first packer **136**. The multi-wellbore well system **100** can include other sub-surface safety valves **160** positioned in other locations (not shown) throughout the motherbore **102** and the lateral wellbore **120**.

The multi-wellbore well system **100** includes a surface controlled formation isolation valve **134** positioned inside of and coupled to the production tubing **126**. The surface

controlled formation isolation valve **134** actuates between an open position allowing fluid flow from the motherbore **102** through the production tubing **126** to the surface **104** and a closed position preventing fluid flow through the production tubing **126**. The surface controlled formation isolation valve **134** acts as a bidirectional barrier to the production tubing **126** where the motherbore **102** is in the third subterranean formation **108***c* (i.e., a lower completion). During a completion operation to enhance fluid flow from the second subterranean formation **108***b*, the surface controlled formation isolation valve **134** can be placed in the closed position to prevent a pressure change in the third subterranean formation **108***c*. After the completion operation is complete, the surface controlled formation isolation valve **134** can be placed in the open position allowing fluid flow from the third subterranean formation **108***c* into the production tubing **126**. In conventional operations, in order to change the position of a conventional formation isolation valve (not shown) between an open position and a closed position, producing the fluids from the multi-wellbore well system **100** is secured, and a workover rig (not shown) is positioned relative to the motherbore **102**, the motherbore **102** is opened, and a shifting tool (not shown) is disposed in the motherbore **102** to actuate the conventional formation isolation valve. The position of the surface controlled formation isolation valve **134** is controlled from the surface **104**.

In multilateral wells (i.e. wells drilled with several laterals downhole), the production flowrate to the production tubing **126** can be physically controlled to reduce any undesired fluid production flowrate from each lateral separately through adjusting the mechanical flow control valves **140**, **144** position. To enable this control feature, the production flowrate should follow a single path into the production tubing **126**. This is where the mechanical formation isolation valve **134** is required. As the production tubing **126** is manufactured as a fluid conduit; it is open from both ends (top and bottom of the production tubing **126** like a straw). The mechanical formation isolation valve **134** caps the bottom end and isolated the production tubing **126**, forcing the production flowrate to pass through the mechanical formation inflow control valve **140**.

The multi-wellbore well system **100** includes a control panel **162** is operatively coupled to the surface controlled formation isolation valve **134**. The control panel **162** is positioned in a space **164** above the surface **104**. The control panel **162** is accessible to an operator (not shown) to operate the control panel **162**. The control panel **162** transmits a control signal to the surface controlled formation isolation valve **134** to actuate between the open position and the closed positon. The control signal can be an open control signal commanding the surface controlled formation isolation valve **134** to open or a close control signal commanding the surface controlled formation isolation valve **134** to close.

The control panel **162** is operatively coupled to the sub-surface safety valve **160** by a sub-surface safety valve control line **168**. The operator can actuate the sub-surface safety valve **160** from the control panel **162**. For example, when a safety condition is detected, the operator can manually operate the control panel **162** to send a command signal via the sub-surface safety valve control line **168** to the sub-surface safety valve **160** to shut, preventing fluid from flowing from the production tubing **126** to the wellhead assembly **148**. In some case, the control panel **162** can automatically shut the sub-surface safety valve **160**.

The multi-wellbore well system **100** includes a surface controlled formation isolation valve control line **166** electrically coupling the control panel **162** to the surface controlled formation isolation valve **134**. The surface controlled formation isolation valve control line **166** conducts the control signal from the control panel **162** to the surface controlled formation isolation valve **134**. The surface controlled formation isolation valve control line **166** can conduct a status signal from the surface controlled formation isolation valve **134** to the control panel **162** indicating the position of the surface controlled formation isolation valve **134**. The surface controlled formation isolation valve control line **166** can conduct electricity from the control panel **162** to the surface controlled formation isolation valve **134**. In some implementations, the surface controlled formation isolation valve control line **166** conducts a hydraulic fluid to operate the surface controlled formation isolation valve **134**.

The multi-wellbore well system **100** includes a single well completion panel **170** positioned in the space **164** above the surface **104** operatively coupled to the motherbore inflow control valve **140** and the lateral inflow control valve **144** to actuate the motherbore inflow control valve **140** and the lateral inflow control valve **144** between the open position, the partially open position, and the closed position. The multi-wellbore well system **100** includes an inflow control valve line **172** operatively coupling the single well completion panel **170** to the motherbore inflow control valve **140** and the lateral inflow control valve **144**. The inflow control valve line **172** conducts a control signal from the single well completion panel **170** to the motherbore inflow control valve **140** and the lateral inflow control valve **144**. The inflow control valve line **172** can conduct a status signal from the motherbore inflow control valve **140** and the lateral inflow control valve **144** to the single well completion panel **170** indicating the position of the motherbore inflow control valve **140** and the lateral inflow control valve **144**. The inflow control valve line **172** can conduct electricity from the single well completion panel **170** to motherbore inflow control valve **140** and the lateral inflow control valve **144**. In some implementations, the inflow control valve line **172** conducts a hydraulic fluid to operate the motherbore inflow control valve **140** and the lateral inflow control valve **144**.

The multi-wellbore well system **100** includes an emergency shutdown system **174** coupled to the surface controlled formation isolation valve **134** to hydraulically operate the surface controlled formation isolation valve **134** in an emergency. The emergency shutdown system **174** is hydraulically coupled to the surface controlled formation isolation valve **134** by an emergency shutdown system line **176**.

FIG. **2** is a flow chart of an example method of controlling fluid flow in a multi-wellbore well system with a surface controlled formation isolation valve according to implementations of the present disclosure. At **202**, in a multi-wellbore well system requiring an intervention job, a control signal is transmitted from a control panel on a surface of the Earth operatively coupled to the well system to a surface controlled formation isolation valve positioned in the multi-wellbore well system at a downhole location. The surface controlled formation isolation valve controls a fluid flow from a motherbore into a production tubing. For example, the control panel **162** at the surface **104** transmits the control signal to the surface controlled formation isolation valve **134**. The surface controlled formation isolation valve **134** controls the fluid flow from the motherbore **102** into the production tubing **126**.

In some implementations, transmitting the control signal to the surface controlled formation isolation valve includes conducting the control signal via a surface controlled formation isolation valve control line electrically coupling the control panel to the surface controlled formation isolation

valve. In some cases, the control signal includes at least one of an open control signal or a close control signal. For example, the surface controlled formation isolation valve control line **166** conducts the control signal to the surface controlled formation isolation valve **134**.

At **204**, the control signal is received at the surface controlled formation isolation valve. For example, the surface controlled formation isolation valve **134** receives the control signal from the control panel **162** at the surface **104** via the surface controlled formation isolation valve control line **166**.

At **206**, after receiving the control signal at the surface controlled formation isolation valve, opening the surface controlled formation isolation valve hydraulically. Operating the surface controlled formation isolation valve responsive to receiving the open control signal at the surface controlled formation isolation valve can include opening the surface controlled formation isolation valve. For example, the surface controlled formation isolation valve **134** can be opened.

In some implementations, responsive to opening the surface controlled formation isolation valve, a flow of the fluid from one subterranean formation of the Earth is conducted through the motherbore into the production tubing positioned in the motherbore. The production tubing fluidly couples the motherbore to a wellhead positioned on the surface. For example, fluid can flow from the third subterranean formation **108***c* into the motherbore **102**, through the motherbore **102**, into the production tubing **126** to the wellhead assembly **148**.

In some implementations, the surface controlled formation isolation valve can be operated responsive to receiving the close control signal at the surface controlled formation isolation valve which can include closing the surface controlled formation isolation valve. For example, the surface controlled formation isolation valve **134** can be closed.

In some implementations, responsive to closing the surface controlled formation isolation valve, the flow of fluid from the subterranean formation through the motherbore into the production tubing is stopped. For example, the fluid flow from the third subterranean formation **108***c* into the motherbore **102**, through the motherbore **102**, into the production tubing **126** to the wellhead assembly **148** can be stopped by shutting the surface controlled formation isolation valve **134**. In some implementations, when the surface controlled formation isolation valve is closed, a motherbore inflow control valve positioned in the motherbore to control the flow of the fluid from the motherbore into the production tubing is operated and a lateral inflow control valve positioned in the motherbore to control a flow of another fluid from the lateral wellbore into the production tubing is operated. For example, the motherbore inflow control valve **140** and the lateral inflow control valve **144** can be opened, closed, or partially open to allow, secure, or throttle fluid flow, respectively, from the third subterranean formation **108***c* and the second subterranean formation **108***b*, respectively.

At **208**, after opening the surface controlled formation isolation valve, the required intervention job can be conducted. For example, intervention jobs can include an array of well intervention operations including, but not limited to, running array production logging tools to profile downhole contribution of the wellbore beyond the production tubing depth, lifting the well with nitrogen for wellbore cleanup, treating the reservoir with acidization to enhance production performance, and running and installing downhole plugs to isolate undesired production of water or gas. Well intervention operations (intervention jobs) are contingent to engineering analysis results of the downhole production performance. These requirements for an intervention job can arise after noticing production performance changes, introduction of water production due to prolonged production duration throughout the life of the well, and/or production enhancement treatments which require accessing the wellbore and removing all downhole restriction limiting achieving the desired depth. The intervention jobs that require full wellbore accessibility can be deployed through coiled tubing.

In some implementations, another control signal is transmitted from a single well completion panel positioned at the surface of the Earth to the motherbore inflow control valve and the lateral inflow control valve via an inflow control valve line to the motherbore inflow control valve and the lateral inflow control valve to operate the motherbore inflow control valve and the lateral inflow control valve. The single well completion panel is operatively coupled to the motherbore inflow control valve and the lateral inflow control valve. The control signal can be received at the motherbore inflow control valve and the lateral inflow control valve via an inflow control valve line to the motherbore inflow control valve and the lateral inflow control valve. For example, the motherbore inflow control valve **140** and the lateral inflow control valve **144** can be operated via a control signal sent from the single well completion panel **170** via the inflow control valve line **172**.

In some implementations, a safety condition is sensed in the motherbore. Responsive to sensing the safety condition in a portion of the motherbore, a sub-surface safety valve positioned in the motherbore is operated via the control panel to isolate the motherbore. For example, the control panel **162** can send a control signal to shut the sub-surface safety valve **160**.

Although the following detailed description contains many specific details for purposes of illustration, it is understood that one of ordinary skill in the art will appreciate that many examples, variations, and alterations to the following details are within the scope and spirit of the disclosure. Accordingly, the example implementations described herein and provided in the appended figures are set forth without any loss of generality, and without imposing limitations on the claimed implementations.

The invention claimed is:

1. A method, in a well system requiring an intervention job, the method comprising:

transmitting, from a single well control panel on a surface of the Earth, the single well control panel operatively coupled to the well system, a close control signal to a motherbore inflow control valve positioned in the well system at a downhole location in a motherbore, the motherbore inflow control valve configured to control fluid flow from the motherbore into a production tubing extending to the surface;

receiving, at the motherbore inflow control valve, the close control signal;

responsive to receiving the close control signal at the motherbore inflow control valve, closing the motherbore inflow control valve;

transmitting, from the single well control panel, a close control signal to a lateral inflow control valve positioned in the production tubing in the motherbore at a downhole location uphole from the motherbore inflow control valve, the lateral inflow control valve configured to control fluid received in motherbore from a lateral wellbore fluidly coupled to the motherbore in the production tubing;

receiving, at the lateral inflow control valve, the close control signal;

responsive to receiving the close control signal at the lateral inflow control valve, closing the lateral inflow control valve;

transmitting, from the single well control panel on the surface of the Earth, an open control signal to a surface controlled formation isolation valve positioned in the well system at a downhole location from the motherbore inflow control valve and the lateral inflow control valve and configured to control a fluid flow from the motherbore into the production tubing;

receiving, at the surface controlled formation isolation valve, the open control signal;

after receiving the open control signal at the surface controlled formation isolation valve, opening the surface controlled formation isolation valve hydraulically; and

after opening the surface controlled formation isolation valve, facilitating completion of the intervention job through the surface controlled formation isolation valve into the well system.

2. The method of claim **1**, wherein transmitting the control signal to the surface controlled formation isolation valve comprises conducting the control signal via a surface controlled formation isolation valve control line electrically coupling the single well control panel to the surface controlled formation isolation valve.

3. The method of claim **1**, wherein the control signal comprises at least one of an open control signal, a close control signal, a partially open control signal, or a partially close control signal.

4. The method of claim **3**, wherein operating the surface controlled formation isolation valve responsive to receiving the open control signal at the surface controlled formation isolation valve comprises opening the surface controlled formation isolation valve and operating the surface controlled formation isolation valve responsive to receiving the close control signal at the surface controlled formation isolation valve comprises closing the surface controlled formation isolation valve.

5. The method of claim **4**, further comprising responsive to opening the surface controlled formation isolation valve, conducting a flow of the fluid from the at least one of a plurality of subterranean formations of the Earth through the motherbore into the production tubing positioned in the motherbore, the production tubing fluidly coupling the motherbore to a wellhead positioned on the surface.

6. The method of claim **1**, further comprising:

after performing the intervention job, closing, from the single well control panel, by the close control signal, the surface controlled formation isolation valve;

operating the motherbore inflow control valve positioned in the motherbore to control the flow of the fluid from the motherbore into the production tubing; and

operating the lateral inflow control valve positioned in the motherbore to control a flow of another fluid from the lateral wellbore into the production tubing.

7. The method of claim **6**, further comprising:

transmitting, from the single well control panel positioned at the surface of the Earth, the single well control panel operatively coupled to the motherbore inflow control valve and the lateral inflow control valve, another control signal via an inflow control valve line to the motherbore inflow control valve and the lateral inflow control valve to operate the motherbore inflow control valve and the lateral inflow control valve; and

receiving, at the motherbore inflow control valve and the lateral inflow control valve via the inflow control valve line to the motherbore inflow control valve and the lateral inflow control valve, the another control signal.

8. The method of claim **1**, further comprising:

sensing a safety condition in the motherbore; and

responsive to sensing the safety condition in a portion of the motherbore, operating via the single well control panel, a sub-surface safety valve positioned in the motherbore to isolate the motherbore.

9. The method of claim **1**, wherein responsive to closing the motherbore inflow control valve, closing the lateral inflow control valve, and opening the surface controlled formation isolation valve, defining a single path in the production tubing from a top end at the surface to a bottom end of the production tubing in the motherbore.

10. The method of claim **9**, further comprising performing the intervention job in the well system through the single path and out the bottom end of the production tubing.

11. The method of claim **1**, futher comprising:

after opening the surface controlled formation isolation valve, passing a coiled tubing assembly through the production tubing through the surface controlled formation isolation valve and into the motherbore, the coiled tubing assembly configured to perform the intervention job.

12. The method of claim **1**, wherein the motherbore inflow control valve and the lateral inflow control valve are configured to control fluid flow from an annulus defined between the motherbore and the production tubing into the production tubing.

13. The method of claim **1**, wherein the surface controlled formation isolation valve is positioned in the well system at the downhole location from the motherbore inflow control valve and the lateral inflow control valve and configured to control the fluid flow from the motherbore into the production tubing through an opening at a downhole end of the production tubing.

14. A well completion system configured to be positioned in a well system comprising a motherbore extending from a surface of the Earth into a plurality of subterranean formations, the motherbore fluidly coupled to at least one of the plurality of subterranean formations to receive a fluid from the at least one of the plurality of subterranean formations and a lateral wellbore extending from the motherbore at a location between a downhole end of the motherbore and the surface, the lateral wellbore fluidly coupled to at least another one of the plurality of subterranean formations to receive another fluid from the at least another one of the plurality of subterranean formations, the well completion system comprising:

a production tubing positioned in the motherbore, the production tubing extending from the surface through the motherbore, the production tubing comprising an opening at the downhole end of the production tubing;

a surface controlled formation isolation valve coupled to the production tubing at the downhole end of the production tubing and positioned in the motherbore to control a fluid flow into the production tubing from the motherbore through the opening at the downhole end of the production tubing;

a motherbore inflow control valve coupled to the production tubing and positioned in the motherbore uphole of the surface controlled formation isolation valve, the motherbore inflow control valve configured to control the fluid flow from the motherbore into the production tubing;

a lateral inflow control valve coupled to the production tubing and positioned in the motherbore at a downhole location uphole from the motherbore inflow control valve, the lateral inflow control valve configured to control the fluid flow of the another fluid from the lateral wellbore into the production tubing; and

a single well control panel positioned in a space above the surface, the single well control panel operatively coupled to the surface controlled formation isolation valve, the motherbore inflow control valve, and the lateral inflow control valve, the single well control panel comprising a controller configured to perform operations comprising:

transmitting, from the single well control panel, a close control signal to the motherbore inflow control valve;

receiving, at the motherbore inflow control valve, the close control signal;

responsive to receiving the close control signal at the motherbore inflow control valve, closing the motherbore inflow control valve;

transmitting, from the single well control panel, a close control signal to the lateral inflow control valve;

receiving, at the lateral inflow control valve, the close control signal;

responsive to receiving the close control signal at the lateral inflow control valve, closing the lateral inflow control valve;

transmitting, from the single well control panel, an open control signal to the surface controlled formation isolation valve;

receiving, at the surface controlled formation isolation valve, the open control signal;

after receiving the open control signal at the surface controlled formation isolation valve, opening the surface controlled formation isolation valve; and

after opening the surface controlled formation isolation valve, facilitating completion of an intervention job through the surface controlled formation isolation valve into the well system.

15. The well completion system of claim **14**, further comprising a surface controlled formation isolation valve control line electrically coupling the single well control panel to the surface controlled formation isolation valve, the surface controlled formation isolation valve control line configured to conduct the control signal from the single well control panel to the surface controlled formation isolation valve.

16. The well completion system of claim **14**, wherein control signal comprises at least one of an open control signal, a close control signal, a partially open control signal, or a partially close control signal.

17. The well completion system of claim **14**, wherein the production tubing extends from the surface through the motherbore to a location downhole from the lateral wellbore.

18. The well completion system of claim **14**, further comprising a wellhead assembly coupled to the motherbore at the surface, the wellhead assembly configured to control the fluid flow from the motherbore.

19. The well completion system of claim **17**, further comprising:

a first packer positioned in the motherbore uphole from the lateral wellbore; and

a second packer positioned in the motherbore downhole from the lateral wellbore and uphole from the surface controlled formation isolation valve.

20. The well completion system of claim **19**, wherein:

the motherbore inflow control valve is positioned in the motherbore uphole of the surface controlled formation isolation valve and downhole of the second packer; and

the lateral inflow control valve is positioned in the motherbore between the first packer and the second packer, wherein the first packer and the second packer control the fluid flow from the lateral wellbore through the lateral inflow control valve into the production tubing, and wherein the second packer controls the fluid flow from the motherbore through the motherbore inflow control valve into the production tubing.

21. The well completion system of claim **14**, further comprising:

an inflow control valve line operatively coupling the single well control panel to the motherbore inflow control valve and the lateral inflow control valve.

22. The well completion system of claim **14**, further comprising a sub-surface safety valve positioned in the motherbore to isolate a portion of the motherbore from the space above the surface.

23. The well completion system of claim **14**, further comprising an emergency shutdown system coupled to the surface controlled formation isolation valve, the emergency shutdown system configured to hydraulically operate the surface controlled formation isolation valve.

24. The well completion system of claim **14**, wherein

responsive to closing the motherbore inflow control valve, closing the lateral inflow control valve, and opening the surface controlled formation isolation valve, defining a single path in the production tubing from a top end at the surface past the motherbore inflow control valve and the lateral inflow control valve, through the surface controlled formation isolation valve, to a bottom end of the production tubing, and out the opening at the downhole end of the production tubing into the motherbore.

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