Troubleshooting method for electromagnetic shut-off valve of hydrocracking unit					
When an accident occurs, contact the dispatcher, instrument, and department on-duty leader, send information and maintain communication, grasp the situation of the unit and respond in time, contact upstream feed units and downstream product units, and change the line.					
Serial number	Solenoid valve position number	description	Phenomenon after abnormal closing/opening	Main hazard	Disposal method
1	UV11012	P102 outlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. The device feed rate FIC11803 drops to zero, alarm. 3. P102 interlocks shutdown. 4. F101 main burner shut-off valve UV14801, UV14802 closed. 5. Hydraulic turbine ST101 interlock, LV12105A closed.	1. The unit feed is interrupted 2. The furnace is interlocked shutdown. 3. Hydraulic turbine interlock, D106 liquid level fluctuates greatly; 4. Large fluctuations in the temperature of the hydrocracking bed. 5. Flange leakage.	1. Contact dispatch to stop supplying feed and change all products to unqualified line. 2. Confirm on-site that the outlet shut-off valve is closed, the pump is interlocked shutdown, and close the pump outlet hand valve, electric valve, and standby pump warm-up line. 3. Confirm the interlocking of heating furnace and hydraulic turbine. 4. Adjust the load of the new hydrogen compressor according to the system pressure. 5. Adjust D106 liquid level. 6. Adjust and monitor the temperature of each bed in the reactor. 7. Establish fractionation short circulation. 8. After the temperature of the reaction bed is controllable, resume feeding and start work. 9. Strengthen the inspection of high-pressure parts on site.
2	UV14801 UV14802	Main burner	1. The valve status on DCS turns red, SIS displays	1. The temperature at the outlet of the furnace drops,	1. Do unit emergency feed reduction. Adjust fractionation according to reaction conditions.

		shut-off valve	interlock and keeps alarming. 2. The fuel gas flow FICQ14801 instantly returns to zero. 3. The furnace temperature of the heating furnace and the temperature of the furnace outlet drop rapidly. 4. The negative pressure in the furnace decreases rapidly and the oxygen content rises sharply	causing the temperature of the R101 reaction bed to be too low, and hydrogenation does not react. 2. Unrefined feedstock oil enters R102, poisoning the cracking catalyst. 3. The hydrogen consumption of the reaction is rapidly reduced and the system is overpressured. 4. The negative pressure is too low and the pilot is extinguished.	2. Quickly adjust the negative pressure in the furnace. Confirm that the main burner shut-off valve of the heating furnace is closed; close the hand valve at the root of the main burner. 3. Confirm whether the pilot is burning normally. 4. Adjust the load of the new hydrogen compressor according to the system pressure. 5. Manually open the main burner shut-off valve, ignite the main burner, and gradually resume production.
3	UV14803 UV14804	Heating furnace pilot shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming	1. The main burner shut-off valve and the pilot light shut-off valve are interlocked and closed; 2. The temperature at the outlet of the furnace drops, causing the temperature of the R101 reaction bed to be too low, and hydrogenation does not react. 3. Unrefined feedstock oil	1. Confirm on-site that the main burner and pilot light shut-off valve are closed. 2. Close the the hand valve at the root of the pilot and main burner, close the main burner control valve. 3. The reaction system feed is reduced to maintain production, and the fractionation is adjusted according to the reaction conditions. 4. Adjust the load of the new hydrogen compressor according to the system pressure. 5. Open the pilot light shut-off valve manually on site. After recovery, gradually ignite the pilot light, manually open the

				enters R102, poisoning the cracking catalyst. 4. The hydrogen consumption of the reaction is rapidly reduced, and the system is overpressured.	main burner shut-off valve on site, increase the main burner according to the actual situation, and gradually resume production.
4	UV13011	New hydrogen compressor outlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. The outlet flow of the new hydrogen compressor is returned to zero. 3. D111 pressure reaches 2.8MPa, the pressure control valve is fully opened.	1. System new hydrogen interruption. 2. The system pressure drops quickly. 3. The safety valve at all levels of the outlet of the new hydrogen machine will jump off.	1. Confirm on site that the shut-off valve at the outlet of the new hydrogen compressor is closed and the new hydrogen compressor is out of service. 2. Quickly reduce temperature and reduce feed. Increase the amount of circulation oil to maintain reaction-fractionation large circulation. 3. Manually open the shut-off valve at the outlet of the new hydrogen compressor. 4. Start the new hydrogen compressor, and increase back pressure and temperature to resume production. 5. Adjust fractionation parameters according to reaction load.
5	UV12510	High pressure lean amine pump outlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. The outlet flow of lean amine liquid is reset to zero. 3. The delivery volume of	1. Circulating hydrogen hydrogen sulfide continues to rise.	1. Confirm on site that the outlet shut-off valve is closed, the pump is interlocked shutdown, and close the pump outlet hand valve and electric valve; contact the instrument to quickly check the cause and repair it in time. 2. Adjust C101 liquid level. 3. Fully open C101 bypass line, the shut-off valve has not been opened for a long time, open the waste hydrogen to ensure the purity of the circulating hydrogen.

			D109 rich amine liquid drops rapidly.		4. Start the backup pump and manually fully open the outlet shut-off valve to resume production
6	UV14313	Medium pressure lean amine liquid outlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. The outlet flow of lean amine liquid is reset to zero.	1. The low gas hydrogen sulfide exceeds the index, causing abnormalities in the PSA unit.	1. Confirm on-site that the outlet shut-off valve is closed, and close the hand valve and electric valve of the pump outlet. Report the dispatch in time and contact the PSA unit. 2. Change the D107 low separation gas to flare, close the offplot control valve and the hand valve in the boundary area. 3. Manually open the outlet shut-off valve to restore the lean amine liquid, and change to PSA after passing the sample of the low gas separation gas.
7	UV14505	Water injection pump outlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. The outlet flow of the water injection pump is reset to zero.	1. High pressure heat exchanger, high and low pressure air-cooler ammonium salt crystallization 2. High pressure to low pressure leak accidents.	1. Confirm on site that the outlet shut-off valve is closed, the pump is interlocked shutdown, and close the hand valve and electric valve at the outlet of the running pump. 2. Manually close D106 interface, D107 interface control valve. 3. Start the backup pump and manually fully open the outlet shut-off valve to resume production 4. If it does not recover for a long time, follow the long-term water injection interruption treatment
8	UV12203	0.7Mpa/min pressure relief valve	1. The status of the valve on the DCS turns green; 2. System pressure decreases.	1. Emergency shutdown of the unit.	1. Confirm that the 0.7Mpa pressure relief is opened on site; quickly analyze the cause and try to maintain K101 operation. 2. Press the 0.7Mpa pressure relief button at CCR; 3. Emergency shutdown of the the unit;

					4. The system pressure is lower than 3.5Mpa, close the hand valve before 0.7Mpa/min pressure relief.
9	UV12204A UV12204B	2.1Mpa/min pressure relief valve	1. The valve status on the DCS turns green; 2. The system pressure drops	1. Emergency shutdown of the unit	1. Confirm on site that the 2.1Mpa/min pressure relief is open 2. In the central control, press the 2.1Mpa pressure relief button 3. Emergency shutdown of the unit. 4. The system pressure is vented to slightly positive pressure
10	UV12204A UV12204B	2.1Mpa/min pressure relief valve	1. The valve status on the DCS is normal, but the valve actually cannot open.	1. Unit temperature excursion or unable to relief pressure	1. Central control start 0.7Mpa pressure relief 2. Open the D106 safety valve to relieve the pressure on the auxiliary line, pay attention to the pressure relief speed of the unit, and stop K101 when it reaches 2.1Mpa/min 3. Emergency shutdown of the unit
11	UV20512 UV20513	C201 stripping steam	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. Stripping steam flow reset to zero. 3. D201 liquid level drops rapidly, C201 liquid level rises rapidly.	1. C201 top product is greatly reduced 2. Hydrogen sulfide enters the fractionation tower and naphtha tower, the product is unqualified 3. C204 overpressure causes EH201 interlock to shut down and shut-off valve to close	1. Reduce reaction feed and temperature 2. Manually reduce the reflux, increase the top temperature of C201, and reduce the light component entering C204 3. Close the stripping steam control valve, fully open the shut-off valve on site, and gradually resume stripping 4. Arrange personnel to go to C204 safety valve platform to prepare the safety valve to open the auxiliary line 5. The stripping steam cannot be used again for a short time, heavy naphtha and light naphtha are changed to the unqualified line, and D211 is changed to the auxiliary line.
12	UV20701	D201 outlet shut-off	1. The valve status on DCS turns red, SIS displays	1. C201 flooding, C205 feed interruption	1. Respond to emergency cooling and reducing volume, reducing the amount of stripping steam

		valve	interlock and keeps alarming 2.P201, P202 stop pump 3. The liquid level of D201 rises rapidly, and the top pressure of C201 rises rapidly.	2. D201 tank full 3. Dry gas entrained with liquid	2. Open the shut-off valve on site and start P201 and P202 to resume production 3. C205 single-tower circulation, fully open A201 fan, control the pressure rise trend, pay attention to the liquid situation of the C202 inlet separation tank and drain the liquid in time 4. After opening the shut-off valve by hand to start P201 and P202, the system resumes normal production
13	UV20501	P204 inlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming 2. P204 stops the pump, and the outlet flow returns to zero;	1. Dry gas C3 exceeds index 2. C203 tower flooding	1. Manually open the shut-off valve on site and start P204 to resume production 2. Contact the dispatcher to change the dry gas to flare 3. Stop C203 lean amine solution 4. Stop P205, wait for P204 to start, then start P205 to gradually resume production
14	UV21012	P206 outlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming 2. The outlet flow of lean amine liquid is reset to zero;	1. The hydrogen sulfide in dry gas exceeds the index	1. Contact the dispatcher and send dry gas to flare 2. Open the shut-off valve manually on site to restore the feed of lean amine liquid 3. The dry gas analysis is qualified and change the dry gas back to to the unit.
15	UV21218 UV21217	C204 stripping steam	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming	1. The C204 top product is too low and the separation effect is poor 2. The bottom component is	1. Close the valve closest to the stripping tower wall (at the root). 2. Open tEH201 outlet safety valve bypass valve, start EH201, and increase the temperature to above 320℃.

			2. Stripping steam flow reset to zero. 3. Electric heater EH201 interlock.	too light, P210 is cavitated, and the recycle oil is too light, which affects the reaction feed.	3. Manually open the shut-off valve on site and start using stripping steam slowly. 4. If the valve cannot be opened for a long time, increase the top temperature of C204 to ensure sufficient top product.
16	UV21501	D203 outlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P208 stops the pump, and the outlet flow returns to zero;	1. C204 tower flooding. 2. C207 feed interruption. 3. The direct supply of heavy naphtha to reformer was interrupted, causing fluctuations in the reforming unit, which in turn affected the fluctuations in the hydrogen system pipeline network.	1. Open the shut-off valve manually on site and start P208 to resume production. 2. Reduce reaction temperature, reduce unit feed and reduce reaction depth. 3. C207 single tower circulation, reduce C204 stripping steam, and change heavy naphtha to unqualified tank area. 4. After P208 is activated by manually opening the shut-off valve, resume normal production.
17	UV21201	P211 inlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P211 stops the pump, the outlet flow returns to zero.	1. Part of the light components enter the recycle oil to the reaction system.	1. Open the shut-off valve manually on site and start P211 to resume production. 2. Be aware of fluctuations raw material properties.
18	UV22401	D208 outlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P215 stops.and the	1. C207 tower flooding, and overpressure. 2. Light naphtha product interrupted. 3. Light naphtha is unqualified.	1. Manually open the shut-off valve on site and start P215 to resume production. 2. Quickly reduce the heat source at the bottom of the tower and change the heavy naphtha to the unqualified line.

			outlet flow returns to zero;		3. If the valve can't be opened for a long time, decrease reaction temperature, reduce feed and decrease reaction depth. Establish reaction-fractionation large circulation. 4. After the shut-off valve is manually opened, resume normal production.
19	UV22321 UV22320	C207 heating steam shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. The heating steam flow is reset to zero.	1. No separation at C207.	1. Reduce the reflux at the top of the tower, change heavy naphtha to the unqualified line, and manually open the shut-off valve on site to resume production. 2. If it can't be opened for a long time, reduce reaction temperature, reduce feed and decrease reaction depth. Establish reaction-fractionation large circulation. 3. After opening the shut-off valve, the system resumes normal production.

Fault handling method of electromagnetic shut-off valve of the LPG Fractionation Unit					
When an accident occurs, contact the dispatcher, instrument, and department on-duty leader, send information and maintain communication, grasp the situation of the unit and respond in time, contact upstream feed units and downstream product units, and change the line.					
Serial number	Solenoid valve position number	description	Phenomenon after abnormal closing/opening	Main hazard	Disposal method
1	UV10101	P101 inlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P101 stops and the	1. Series I feed interruption. 2. D101 liquid level rises rapidly.	1. Confirm on site that the shut-off valve is closed and the pump is interlocked to stop the pump. 2. Open the shut-off valve manually on site and start the pump to resume feeding. 2. If it cannot be opened for a long time, establish single

			outlet flow returns to zero.		tower circulation for series I and III, Change feed to unqualified line and stop delivering products. 3. After shut-off valve is opened, resume normal production.
2	UV10201	P102 and P103 inlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P102 and P103 stop, and the outlet flow returns to zero.	1. C101 reflux interrupted. 2. C102 feed interruption.	1. Confirm on site that the shut-off valve is closed and the pump is interlocked to stop the pump. 2. Manually open the shut-off valve on site and start the pump to resume production. 3. If it cannot be opened for a long time, Cut off C101 feed, maintain temperature, pressure and liquid levels. Change series I feed to unqualified line. 4. C102, C301 single tower circulation 5. Resume production after the shut-off valve is opened.
3	UV10102	C101 bottom shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. C101 bottom outlet flow is zero.	1. C101 liquid level rises rapidly. 2. C301 feed is basically interrupted.	1. Confirm that the shut-off valve is closed on site. 2. Open the shut-off valve manually on site to resume production. 3. If it can't be opened for a long time, establish single tower circulation for series I and III, change feeds to unqualified line and stop delivering products. 4. Resume production after the shut-off valve is opened.
4	UV10401	P104 inlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P104 stops, the outlet flow returns to zero.	1. C102 tower flooding. 2. The flow of C3 at the bottom of the tower fluctuates sharply.	1. Confirm on site that the shut-off valve is closed and that the pump is interlocked to stop. Reduce the heat source at the bottom of the tower, and try to ensure the normal pressure of C102. 2. Manually open the shut-off valve on site and start the pump to resume production.

					3. If it cannot be opened for a long time, Establish C101 single tower circulation, maintain temperatures, pressures and liquid levels of C102, then establish single tower circulation for series III. Change feeds to unqualified line and stop sending out product. 4. Resume production after the shut-off valve is opened.
5	UV10301	C102 bottom shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. Return flow at the bottom of C102 to zero.	1. C102 liquid level rises rapidly. 2. The flow of C3 at the bottom of the tower fluctuates greatly. 3. The quality of liquefied gas products is unqualified.	1. Confirm that the shut-off valve is closed on site. 2. Open the shut-off valve manually on site to resume production. 3. If it can't be opened for a long time, establish series I and III single tower circulation, change feeds to unqualified line and stop sending out products. 4. Resume production until the shut-off valve is opened.
6	UV20101	P201 inlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P201 outlet flow is zero.	1. C201 feed interruption. 2. D201 liquid level rises rapidly.	1. Confirm on site that the shut-off valve is closed and the pump is interlocked to stop the pump. 2. Open the shut-off valve manually on site and resume production after starting the pump. 3. If it can't be opened for a long time, establish series II single tower circulation, change feeds to unqualified line and stop sending out products. 4. Resume production after the shut-off valve is opened.
7	UV20102	C201 bottom shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. C201 bottom flow is	1. C201 liquid level rises rapidly.	1. Confirm that the shut-off valve is closed on site. 2. Open the shut-off valve manually on site to resume production. 3. If it can't be opened for a long time, establish series II single tower circulation, change feeds to unqualified line

			zero.		and stop sending out products. 4. Resume production after the shut-off valve is opened.
8	UV20201	P202, P203 outlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P202 and P203 stop, and the outlet flow returns to zero.	1. C201 reflux interrupted. 2. C202 feed interruption.	1. Confirm on site that the shut-off valve is closed and the pump is interlocked to stop the pump. 2. Manually open the shut-off valve on site and start the pump to resume production. 3. If it cannot be opened for a long time, cut off C201 feed and maintain temperature, pressure and liquid levels., Change the feed to unqualified line and stop sending out products. 4. C202, C203, C204 single tower circulation. 5. Resume production after the shut-off valve is opened.
9	UV20401	C202 bottom shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. The outlet flow at the bottom of C202 is reset to zero;	1. C202 liquid level rises rapidly. 2. C203 feed is cut off and refined propylene production is interrupted.	1. Confirm that the shut-off valve is closed on site. 2. Open the shut-off valve manually on site to resume production. 3. If it can't be opened for a long time, establish C201, C203 and C204 single tower circulation, maintain C202 pressure, temperature and liquid levels. Change the feed to unqualified line and stop sending out products. 4. Resume production after the shut-off valve is opened.
10	UV20402	P204 inlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P204 stops, the out.let flow returns to zero	1. C202tower flooding; 2. C3 flow at the bottom of the tower fluctuates sharply.	1. Confirm on-site that the shut-off valve is closed and the pump is interlocked to stop; 2. Quickly reduce the bottom heat source of C202, control the pressure of C202 within the index range, and open the large E203 circulating water valve in time. 3. Maintain C202 bottom to C203, increase C203 hot water

					heat source to ensure refined propylene is sent out as normal. 4. Open the shut-off valve manually on site and start the pump to resume production.
11	UV20501	C203 bottom shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. C203 bottom outlet flow is zero.	1. C203 liquid level rises rapidly.	1. Confirm that the shut-off valve is closed on site. 2. Open the shut-off valve manually on site to resume production. 3. If it cannot be opened for a long time, establish series II single tower circulation, change feed to unqualified line and stop sending out products. 4. Resume production after the shut-off valve is opened.
12	UV20502	C204 bottom shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P205 interlocks to stop, and the outlet flow returns to zero.	1. C204 liquid level rises rapidly. 2. C204 tower flooding and overpressure.	1. Confirm that the shut-off valve is closed on site. 2. Panel operation appropriately reduce the heat source at the bottom of C203, open the C204 top cold bypass control valve, increases the air-cooler fan, and if necessary, open the D204 top control valve to control the pressure; At the same time, manually open the shut-off valve on site and resume production. 3. If it can't be opened for a long time, operate C203 at a reduced temperature. Directly change C203 bottom distillate passing through E207 to the unqualified LPG tank, stop sending out refined propylene and close UV20602. 4. Resume production after the shut-off valve is opened.
13	UV20601	P206 inlet	1. The valve status on	1. C204 reflux interruption.	1. Confirm that the shut-off valve is closed on site.

		shut-off valve	DCS turns red, SIS displays interlock and keeps alarming. 2. P206 interlocks to stop, and the outlet flow is reset to zero 3. Refined propylene delivery flow is reset to zero	2. C204 tower flooding and overpressure.	2. Panel operation appropriately reduce the heat source at the bottom of C203, open the C204 top cold bypass control valve, increases the air-cooler fan, and if necessary, open the D204 top control valve to control the pressure; manually open the shut-off valve on site and resume production at the same time. 3. If it can't be opened for a long time, operate C203 at a reduced temperature. Directly change C203 bottom distillate passing through E207 to the unqualified LPG tank, stop sending out refined propylene and close UV20602. 4. Resume production after the shut-off valve is opened.
14	UV20602	Refined propylene shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. Return flow of refined propylene to zero;.	-	1. Confirm that the shut-off valve is closed on site. 2. Open the shut-off valve manually on site to resume production 3. If it cannot be opened for a long time, fill D204 first, fill D206 through the gas-phase propylene line, increase flow to C203 as much as possible to store in C203 and C204. If it can't be opened for a long time, operate C203 at a reduced temperature. Directly change C203 bottom distillate passing through E207 to the unqualified LPG tank. 4. Resume production after the shut-off valve is opened.
15	UV30101	C301 bottom shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P301 interlocks to stop	1. C301 liquid level rises rapidly. 2. Unqualified LPG products.	1. Confirm that the shut-off valve is closed on site. 2. Open the shut-off valve manually on site to resume production. 3. If it cannot be opened for a long time,cut off series I and III feed and establish series I and III single tower circulation.

			and the outlet flow returns to zero.		Stop sending out isobutane, change C201 bottom LPG to unqualified line, change feeds to unqualified line and stop sending out products.. 4. Resume production after the shut-off valve is opened.
16	UV30201	P302, P303 inlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P302, P303 interlock to stop, and the outlet flow will return to zero.	1. C301 tower flooding.	1. Confirm that the shut-off valve is closed on site. 2. Open the shut-off valve manually on site to resume production. 3. If it cannot be opened for a long time, establish Series I single tower circulation, change isobutane to unqualified line, change feed to unqualified line and stop sending out products. 4. Resume production after the shut-off valve is opened.
17	UV30202	P303 inlet shut-off valve	1. The valve status on DCS turns red, SIS displays interlock and keeps alarming. 2. P303 interlocks to stop the pump, and the outlet flow returns to zero.	1.D301 liquid level rises rapidly. 2. Stop delivery of isobutane products.	1. Confirm that the shut-off valve is closed on site. 2. Open the shut-off valve manually on site to resume production. 3. If it can't be opened for a long time,establish series I and series III single tower circulation, change LPG to unqualified line, change feed to unqualified line and stop sending products. 4. Resume production after the shut-off valve is opened