

# THE DESIGN OF SALT PROCESS EQUIPMENT PROBLEMS

Xing Yahui

CNSIC Pingdingshan HaoLong Co.,Ltd Pingdingshan Henan 467001

**Abstract:** According to production operation's arrangement construction's employment history, elaborated that improves the technique of production and the equipment flow from the technological design, thus realizes the stable production.

**Key words:** Adverse current feeding, Circulating Pump, Pump accident, Material mix

## 1. INTRODUCTION

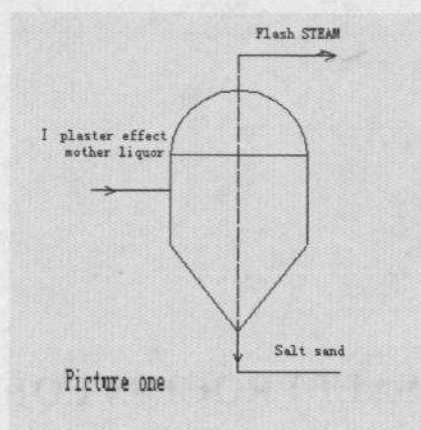
Participated in the 300,000 tons / year and 600,000 tons / year of salt production system preparations for the construction, and operation of the productive system, gradually found many ignore the planning stage of the technology and so on, these issues do not make the total Production technology has fatal flaws, but it gives us the operation of production brought about by the unnecessary trouble, it affects the production, not only in this article in place of the defective process, from the other side of the cut, simply point to a few people with a total of Supper.

## 2. ANALYSIS

### 2.1 feed down salt Technology

The main characteristics of the current feed is to the latter effect as the effect of the previous warm-up, the results from the liquid into effect after the former energy forward, the increased frequency of the use of thermal energy, increasing the effective temperature of

the system, increase the intensity of evaporation, Increasing salt and salt production. In theory counter-current feed though to explore a lot of benefits, but for the results to move forward the materials and energy efficiency when the liquid in a large number of impurities, such as  $\text{GaSO}_4$  into effect before the end enrichment I in effect, so that the effect I Tank concentration of impurities, such as gypsum, salt flows through the Shun II to the effect of the impurities away when he was sent back to feed current I effect, so how effective discharge of the first tank impurities current feed technology is the biggest obstacle to the technology. Designers to design the next cycle of pipe installed on a set of blind control device row gypsum plaster scheduled to become the main channel, I effect tank liquid temperature around  $118^\circ\text{C}$  in general, if the atmospheric pressure directly into the plaster mother liquor barrels, to a large number of mother liquor Step-down Flash plug salt precipitation in the row gypsum export pipeline, designers I to effect the introduction of mother liquor gypsum as a closed-thickening as the flash barrels, as shown in Figure 1:



I plaster effect mother liquor flash in the bucket have a flash steam recovery to the heating effect II room, mother liquor after the evaporation of precipitation sand with salt mother liquor by the centrifugal pump to tank, this program theoretically feasible, but the actual operation of considerable difficulty. The reason is that with the lower part of a large quantity of salt, gypsum sand liquidity is not good, often blocked exports, sent custody can not be dealt with in a timely manner, as a result of the final plug exports of a salt sand, heat flashover mother liquor shun fat pipe steam heating effect II influx of a large number of rooms I used the company II room heating efficiency condensing water as a chemical boiler water supply, salt mother liquor into the boiler after a four-day shutdown caused by the company. In response to the cause of the accident to prevent recurrence, the study of technical staff decided to feed upstream, downstream process for the stratospheric salt feed, salt downstream process.

Although the current feed, salt down the use of technology will not be long, but it does have energy-saving effects from the historical data, the salt wasting tons of steam 0.89 ~ 0.93T, feed the stratosphere down salt salt wasting process steam to 0.93 0.97T, and the degree of salt into the stratosphere than expected, down salt uniform process. That technology and progress, if impurities in tackling the problem of emissions, it is bound to impact the current stratosphere widespread use of the feed, salt downstream process.

## 2.2 The mix of materials

With the development of science, a large number of corrosion-resistant materials

for the production of salt industry, such as Titanium, 2205 stainless steel, 316L stainless steel, 316 stainless steel and so on, we have set up factories in 2094, when the use of titanium and titanium alloys produced by the heating pipes, since the use of Not a leak and corrosion was not found. From the scientific point of view, such a long period of high temperature metal salt solution should be subject to corrosion has not been found corrosion, Titanium corrosion who have not been corrupted by it? Stainless steel. Stainless Steel and Titanium in the brine in a different pose a potential difference as a result of the original battery, and its potential lower than the Titanium, occurred in the electrochemical reaction, Titanium is the anode, cathode is stainless steel, and stainless steel cathode protection of the law as corrosion, Titanium Protected material, the titanium tube will be more than a decade as good as new, that is what we can to evaporation and the cycle of inner wall lined stainless steel tube is often corrosion, material from 316 to upgrade to 316L, up to now been upgraded to better than 316L of 2205 Di Buzhu or stainless steel corrosion, weld position of non-piercing tank. I personally think that would solve the corrosion of the tank and not in a hurry to change materials, first of all have to understand the reasons, for reasons to take measures to replace the blind than good material to be more than good. In 2205, we used to produce stainless steel equipment, auxiliary channel 316L is a material with 2205 welding electrode materials together, the results of the weld joint position 316L by corrosion leaked, even if that is corrosion-resistant materials mix together the different scientific.



In this regard, we are currently trying out the use of cathodic protection law, with the largest activity of metal materials in liquid in the tank and connected to the activity intended to corrosion of materials in order to protect equipment, the protection of concrete results will take time to verify, we will make a detailed record.

### **2.3 cantilevered circulating pump**

We have built in 2094 from 300,000 tons salt on the use of cantilever circulating pump, then say it's the biggest advantage is that through the belt and electrical connections, will not be as easy as connecting to the round of the burning of the electrical advantages. Actual proof of this than does the design of the wheel well connected, overload, slipping belt voice to remind the operator and has played a buffer role of the non-injury motor; another easy disassembly of this pump, pump body or a short period of time can be replaced Motor, but the design of the installation of ill-considered approach is not taken into power few hundred kilowatts in the role of the circulating pump, the reaction force needed to support balance, the location of the reaction in connection with the pump body under the control of the cycle of Cone, Force after the break, then back to the motor side plate under the cone to bear a lot of stress and Latin America, together with the cantilever circulating pump running large or small, non-stop swing, resulting in the occurrence under the cone of metal fatigue, caused by intergranular Corrosion to form a new interface, just become the best electrochemical reaction discharge corrosion, corrosion combination of both, so that part of the accelerated corrosion, often piercing. Our company 300,000 tons / year production line using the same design of the cone under severe corrosion or five years ago to replace them all, in 2006 and 2007, two new 600,000 tons / year production line of eight under the cone, has missed seven 000 individual cone many times under the leak.

In view of this, I think the technology is in constant succession and development, even if the axis-of-cycle pump with the advantages of cantilever of the circulating pump belt linkage of the advantages of

combining the cycle of the pump motors and pumps are fixed cycle In the reinforced concrete base, the linkage through the belt so that the reaction of the circulating pump in the role of the reinforced concrete base, so that the plate is no longer under Cone under tensile stress, oscillating pump head disappeared, under a very small cone of metal fatigue, and also as a result of belt Swing caused by the pump impeller and the motor impeller micro-changes in the relative position of smaller and reduce wear and extend the service life.

### **2.4 circulating pump impeller**

Domestic circulation pump impeller is vulnerable components, particularly with the salt slurry impeller collision is very easy to wear, so producers interested in thicken at the time of manufacture, resistance increases, reducing the efficiency of pump, if at the time of manufacture the wear-resistant alloy bordered plane collision Steel can be a little thin, and the extension of the life and enhance efficiency.

### **2.5 Room heating is relatively high**

Our 600,000 tons year of production systems, heating rooms, the board spent the next level than the balance of their effect Flash barrels lower the upper plane 15 ~ 20cm, heating board room to spend the next level with the balance between the central line of barrels of only 50 ~ 70 cm , Condensate exports ranked in the plane, indoor heated condensate into the difficult balance barrels, so that the lower part of the room heating water, do not plug the condensing steam emission exports, resulting in poor non-condensing steam emissions, but also the lower part of the heating room heating pipe Dip in the water condensation will not achieve the desired effect by effectively reducing the heat transfer area, so heated room with a barrel of a high degree of balance is the key difference.

## 2.6 tank liquid observation hole

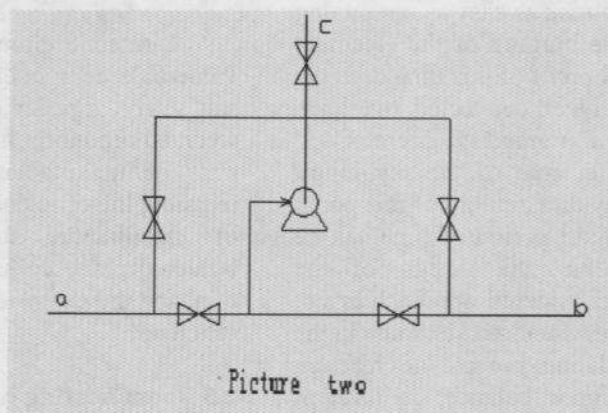
With the popularity of electronic products, the effect of the liquid is boiling equipped with a video monitor the situation in the industry with many of its units have only care about, not pay attention to its application, video observation hole opened in the top of the cone-top cans, To watch the liquid straight down, and the surface can not see the changes in the location of the wall, not practical.

In the design of observation hole should be as much as possible in the opening cans evaporated on the lower part of the cone, can

be viewed from the side of the wall surface and can change the location, appears to be small, given the production operator a great convenience.

## 2.7 accidents pump

Accidents pump, as its name suggests the accident was produced by the pumps, using less time. In practice, as long as usual to enactment of the incident pump technology import and export through the pipeline to connect more and more accidents pump with a pump, general-purpose. Figure 2:



0 meters and a terminal connected to mains accident, b-side in the workshop with the 0 m external barrels accident, miscellaneous buckets, the original brine pool, circulating cooling water pipes to connect, and so on, c-side and 9 meters accident tube (that is, salt foot pipe accident), The upper part of a bucket of miscellaneous imports, imports of accidents, such as connecting the upper barrel. Through the pump around five valves can switch the play pump water miscellaneous brush pot to brine into the tank, water from the tank expected to shrink, cans of different materials such as liquid conversion. Special attention is that the accident pump on the import and circulation of cooling water pipe connection, Sheung Shui, there are cooling cycle 0.6MPa pressure pump accidents with it in series after the export of up to the pressure 1.3MPa, regardless of the accident or salt foot pipe plug to plug, In a short period of time can pass red; other in practice we have experience in a particular cause of white water into the

tank under the miscellaneous will evaporate with a bucket of water reserves run out, the formation of water can make up, and cooling cycle Water water after connecting this problem no longer exists. These valves connect with the corresponding equipment used in combination, will be the same as Magic transform a variety of practical operation, so that accidents become more pumps with pump.

## 2.8 Dry bed

In recent years, developed a number of domestic dry bed, is the basic capacity of 70 tons / hour, more than 70 tons / hour, as we use a company's production of 90 tons / hour bed, can not Design capacity. Can we say that such technology so advanced, no law can be found! To address the needs of production, our technical staff of the Joint R & D of 130 tons / hour dry bed, 8.5-9 tons per hour of steam power, the first Asian record.

## 2.9 Process design extremes



Technology designed only to consider the positive side, without considering how it is not normal operation to save the surface of the part of the investment, a fact that the incident had cost them to come back up, the less effective. Such as: a balance between the barrels of automatic water valve to the main water pipes should have a normal way (that is, automatic water) and back-up water pipes to the road. When the installation of our company in order to save money to spare to save water main road, over-reliance on automatic valves, results of the operation of the automatic valve stem off, can not by-pass, leading to exhaust air production for more than an hour, less More than 120 tons of salt, can not talk about how much the creation of effective, more than an hour nearly 30 tons more coal, to buy the number of valves and bypass pipe. So more than a few hypothetical question, from design to install on an emergency plan contains.

### 3. CONCLUSION

Technology is designed to be a serious, responsible and strong, design flaws will be brought to the huge economic losses, some of the problems found after the reform, even if some problems were found, as a result of on-site layout, equipment and so on have been stereotyped can not reason, will become the permanent defects, so the key process design in particular, in the beginning of each

construction project on its importance. From the viewpoint of the development of the design process is a dynamic process, with the social needs and changes in technology and continuous improvement and enhancement, technology designers and grass-roots level to the ordinary exchange of technicians and operatives, to absorb a wide range of views on the design of appropriate Adjustment, not only the design regardless of the consequences. General technicians and operatives could not see anything profound to the theory, but might be able to offer their valuable suggestions, so that professionals from the area have been inspired by technology professionals on a small improvement in technology will enable a more rational and easier to operate, producing more Assured, the realization of the production process and simultaneously improve the technique, theory and practice of each other, a virtuous circle.

### About the author:

Xing Ya-hui, men, in 1970, undergraduate, engineers, professional inorganic chemicals, in March 1994 to engage in the work of salt so far, have been engaged in the production and operation, technical research, the new building, project preparation, the quality of the current minister of science and technology.