BARON CHEMICALS & SYSTEMS PVT. LTD.

dwfyax okVj flLVe (Cooling Water System) esa leL;k;sa (Problems) vkSj jlk;fud fof/k (Chemical Method) }kjk mudk lek/kku (Treatment)

1. tax yxuk (Corrosion) ,d fo|qr jlk;fud izfdz;k (Electro Chemical Reaction) gSA

ftlesa ykSgk viuh izkjfEHkd Lo:Ik ykSgk v;Ld (Iron Ore) esa vk tkrk gSA tax yxus dk fy, rhu vge phtksa dh eq[; vko';drk gSA tSls ,ukM @ dSFkksM vkSj byDVªksykbV] /kkrq dk ,d fgLlk ,ukM @ dSFkksM curk gSA rFkk ikuh mu nksuksa dks tksMus ij byDVªksykbV gksrk gSA fuEufyf[kr dkjd (factor) corrosion dks izHkkfor djrs gSA

1* gekjk flLVe fdl /kkrq (Metallurgy) dk cuk gSA
2 Circulating Water (ljdqyfVax okVj) dh pH D;k gS ?
3 /kyu'khy xSl (Dissolve Gases) O_2, CO_2, SO_2, NH_2, etc
4 /kyu'khy vkSj v/kyu'khy inkFkZ (dissolve & Suspended Solids)
5 ikuh dk osx (Water Velocity)
6 ikuh dk rkieku (Temperature)
7 lw{e thoh; o`f) (Microbiological Growth)

fuEufyf[kr izdkj ds tax **(corrosion)** tks **(Cooling System)** flLVe esa gksrs gSA

1 lk/kkj.k tax yxuk (General Type of corrosion)
2 LFkkuh; tax yxuk (Localised Corrosion)
3 osx ds dkj.k tax yxuk (Corrosion due of Velocity)
4 ;kaf=d @ HkkfSÿkd nokc ds dkj.k tax yxuk (Corrosion due to mechanical stress)

Que:- Corrosion Inhibitor fdl izdkj dk;Z djrk gS **?**

Ans:- Corrosion Inhibitor Water Treatment Chemical esa mifLFkr gksrk gSA tks fd (metal surface) ij ,d iryh irZ (thin Passivation Film) cuk ysrk gS] vkSj (oxygen) dk metal ds attack djus ij ,d Barrier dh Hkkfr dk;Z djrk gSA blls Passivation Film ls System esa fdlh izdkj dh ck/kk mRiUu ugh gksrh gSA

Scalling :- ikuh esa Ca vkSj Mg (ions) ds dkj.k dBksjrk jgrh gS ikuh esa /kqyu'khy (Dissolve) ;kSfxd (Compounds), ;s xeZ gksus ij v/kyu'khy (Insluble Form) esa vk tkrs gS rFkk Precipitate gksdj System dh lrg (Surface) ij ,d iryh irZ (Thin Layer) ds :Ik esa teus yxrs gSA tks ckn esa dBksj gks tkrs gSA bls Scalling dgrs gSA

Scalling ls **System** esa fuEu leL;k;sa gks ldrh gS

1 Å"ek dk vojks/ku (Rereduced Heat Transfer)

2 . Increase Pressure Drop
3 Ldsy vkSj /kkrq ds chp tax yxuk (Under Deposit Corrosion)

Cooling Tower System esa fuEufyf[kr dkjdk lsa **Scaling** gksrh gS k

1. rkieku (Temperature)
2 . pH
3. ?kqyu'khyrk (Solubility)

Que:- Scaling dks de djus fd;k tk ldrk gSA
Ans :- Scaling dks izk;% nks rjhdks ls de fd;k tk ldrk gS
1. ckgjh mipkj (External Treatment)
2 vkUrfjd mipkj (Internal Treatment)

1. ckgjh mipkkj **(External Treatment)**
ckgjh rjhdks esa izk;% nks midj.k bLrseky gksrs gSA (1) Softener & (2) D.M. Plant

(1) Softener &
(2) D.M. Plant
1 **Softener** ikuh esa ls Scaling cukus okys Ca^{++} vkj Mg^{++} ds vk;uks dks fudky dj Ldsy (Scale) u cukus cky s lksfM;e (Sodium) vk;u ys tkrk gS] lksfM;e ikuh esa vf/kd ?kqyu'khy (Soluble) gSA tcfd dSfY'k;e vkj eSXuhf'k;e ds Ions de /kqyu'khy (Insoluble) gSA Softener ds iz;kx ls dqy /kqyu'khy inkFkZ (TDS) de ugh gksrh gSA

Deminiralization (DM) Plant :- D.M. Plant esa ls lkkuh ls lkjs Cation vkj Anion dks fudky fn;k tkrk gSA vkj tks ikuh gesa izkIr gksrk gSA og 0;ogkfjd :Ik ls 'kU; (TDS) < 5 dk gksrk gSA

Lkpuk **(Notice) :-** Softener vkj D.M. dh lQyrk @ mi;ksfxrk izk;% budh Regeneration vkj Backwashing dh dk;Z d'kyrk ij fuHkZj djrh gSA

2 vkUrfjd mipkkj % **(Internal Treatment)**:- Ldsy (Scale) jksdus ds vkUrfjd rjhds izk;% dsfedy dh lgk;rk ls fd;s tkrs gSA

1. dSfY'k;e vkj eSfXuf'k;e (Ca & Mg)dks leklr djus ds fy;s Phosphate Based Chemical dsfedy izk;% iz;kx gksrk gSA

Que:-Antiscalants fdl izdkj dk;Z djrk gS **?**
Ans:-Antiscalants Water dh ?kqyu'khyrk (Solubility Increase) esa of) dj ds scalants dks Deposit Ukgh gksus nsrk gS vkj vyx & vyx (Disperse Form) jgrk gSA Scaling dks jksdus ds fy,s Crystal dk ,d fu;r vkdkj esa c<uk t:jh gSA vkj tc ;g c<rk jgrk gSA rc Antiscalants Crystals esa lekdj mudh pkjrQk c<r dks jksdrk gSA fdlh rjg Crystal c<rk Hkh gSA rks vi.kZ Crystals curs gSA vkj ;g Scale cukus esa vleFkZ gSA

Fouling % & Fouling v?kfyr inkFk (Suspended Particles) d Deposition d dkj.k gkrk gA bl idkj dk Deposition Cooling Tower e de ox oky {k= (Low Velocity Areas) e gkrk gA ;fn Heat Exchanger dh Shell Side ij de ox dk ikuh cg jgk gA rc Fouling Material Shell Side ij tek (Deposit) gk tkr gA bl Scale dh leL;k vk tkrh gA

Cooling Tower Sysem e fuEu lfd; **(Potential Foulants)** d dj.k **Fouling** gkrh gA

1 Dust & Silt (/ky vkj feVVh)
2 Corrosion Products (tax d mRikn)
3 Sand (j)
4 Natural Organic (ikdfrd dkcfud lEink)
5 Microbial matter (Lk{e tho dh; inkFk)

fuEufyf[kr dkjdk l **System** e **Fouling** gkrh gA

1 Water Characteristics (ikuh d x.k)
2 Temperature (Rkkieku)
3 Water Velocity (ikuh dk ox)
4 Microbial growth (l{e tfodh; of))

Que:-Antifoulants fdl idkj dk;l djrk g **?**

Ans :- tc NkVs & NkVs v?kyu'khy inkFk d d.k cB tkr gA rks Fouling gkrh gA v/kyu'khy inkFk e (Negative) pkt gkr gA Antifoulants Chemicals ,d cgyd; ;kfxd (Polymeric Compound) gA tc ikuh e bldk Mkyr g rk ;g v?kyu'khy inkFk dk viu e lk[k yrk gA vkj bl rjg l mudk Negative Charge c< tkrk gA ftl dkj.k og ,d nlj l nj& nj jgr gA vkj ikuh e rjr jgr gA ftl ;g bdë gkdj System dh lrg ij ter ugh bl idkj Antifoulants dke djrk gA

Microbiological growth (l{e thfo; of))

Lk{e thoh; dh of) (Microbiological growth) dju d fy, db idkj dh vudyh; ifjfLFkfr;k (Excellelt condition) nrk gA rkieku (temperature) vkj thok.k ...(Bactria and pH of circulating water) d fy; vkn'k ifjfLFkfr;k gA dkb (Algae) vkj thok.k (Bactria) dh of) d fy; Hkh gA bld vfrfjDr dkcfud inkFk ...(Organic matter) vdkcfud inkFk (Inorganic matter) vkj l; dk idk'k (light) Hkh l{e of) d fy; lgk;d gA fofHkUu (Micro-0rganism) l fuEufyf[kr idkj dh leL;k,a gkrh gA

(a) Algae (dkb):- dkb dh of) d rhu eyHkkr L=kr pkfg;A tl :- gok] ikuh] vkj l; idk'k] Cooling water d Deck e dkb (Algae) dh vf/kdrk l Distributer Nozzles chock gk tkr gA vkj ikuh dk ox (Water flow) de vkj Cooling System dh dk; {kerk (Efficiency) de gk tkrh gA

Bacteria (Tkhok.k):- Cooling System e db i idkj d thok.k ik;s tkrs gA dN e[; i idkj d thok.k fuEufyf[kr gA

Pseudomonas (lhMkseksukl):- ;s Aecrobic Tkhok.k gkrs gA ftudh of) d fy;s vkDlhtu dh t:jr gkrh gA tks ,d fpifpik inkFk mRlftr djrs gA

Sulphate Reducing Bacteria :- ;s Anaerobic Bacteria (thok.k) gA ftudk of) djus d fy;s vkDlhtu dh vko';drk ugh gkrh gA bl i idkj d thok.k ls Under Deposition gkrk gA ftlls Under Corrosion gkrk gA

Que:- How do the biocide work ?
lk'u :- ok;ksklkbM fdl idkj dk;Z djrk g ?

Ans:- Biocide Chemicals gkrs gA tks ,d dkfldk (Cell) dh eyHkwr ifd;k e vojks/kd mRiUu dj nsrk gA Biocides lq{e thok ij tgjhys inkFk (Poisonous Material) dh rjg dke djrk gA dkf'kdk dh nhokj (wall) dks lekIr dj nsrk gA vkj bl idkj biocide dkbZ dks ekj nsrk gA

dfedy dh regular doses ls lq{e thoh; of) ugh gkrh gA e'r dkbZ dks ge uxh vk[kks ls n[k ldrs gA gjh dkbZ e'r gkus d ckn Hkjh gks tkrh gA ikjEHk e ;fn dkbZ cgr T;knk g rks Lo;s ftruk lHko gks ld lkQ dj nsuk pkfg;sA ojuk e'r dkbZ ls ikuh e foulants dh mRifŸk gks tkrh gA ftls pipelines and strainers e choking vk tkrh gA ;s leL;k;s total cooling water treatment d)kjk jlk;fud vkj Hkkfrd fof/k;ks ls dVªky dj ldrs gA

Example :- water treatment fuEufyf[kr thing design, location and water chemistry ij fuHkj djrk gA

1. corrosion inhibitor
2. dispersant
3. biocide
4. scale inhibitor

Monitoring and control (ijh{k.k vkj jksd Fkke)

vkS|ksfxd ikuh d lek/kku d fy;s ...monitoring and controlling Lks treatment dh dk;Z d'kyrk dk irk pyrk gA bld vfrfjDr ...monitoring and controlling d vkj Hkh dbZ ykHk gA

1 dfedy dh vf/kdrk ;k deh dk irk yxkuk
2 in"k.k ekudks d vuqlkj pykuk
3 vf/kd iHkkoh ...treatment plant operation d fy,s cgr mi;ksxh gA
4 dfedy ls ikuh vkj Åtk dh cpr gksrh gA

5 l;= dh mRiknu {kerk dk c<kuk gkrk gA

dfedy VhVeUV ikxke dk lo{k.k **(monitoring and controlling)** fuEu idkj dj ldr gA

1 ikuh ijkehVj VfLVx
2 ikuh VhVeUV dfedy fudy d vo'k"k dk l{e & fo'y"k.k
3 dkjktu diu ekfuVj
4 fouling depositor
5 l{e tfodh; x.kuk

METHOD OF MONITORING

system dk ijh{k.k manual and online djr gA NkVs system e ...manual monitoring djr gA tcfd db cMs system e online monitoring djr gA tSls power plants vkj refineries etc

WATER PARAMETERS MONITORED

lkekU; r% cooling water system e fuEufyf[kr parameters ekir measured gA

1. Hardness (Both total and Calcium)
2. M. Alkalinity
3. Total Dissolved solids (TDS)
4. Total Suspended Solids (TSS)
5. pH
6. Chloride
7. Silica
8. Iron
9. Specialty Chemicals Residual.
10. Chlorine residual.

Other residuals