**SCADA b,fvJ?bmvJ**

1/SCADAqdkwm Supervisory Control And Data Acquisition vdkYac:ygw,f/ t"dyÜm,fuawmh Control System awGtoHk;jyKwJh puf&Hk? tvkyf&HkawG? vQyfppf"mwftm;ay;pepfawG? pufrIvkyfief;awGrSm BuD;MuyfrI tenf;qHk;ESifh tcsuf tvufawG&,lEdkifr,f? tcsuftvufawGxdef;odrf;r,f? udk,fvdkcsifwJh Data tcsuf tvuf awGudk jyefxkwfay;EdkifNyD;cdkif;apEdkifwJh System wpfckjzpfygw,f။ SCADA System onf ,ckESpfawGtwGif;rSm Physical Experiments awGvdk&IwfaxG;wJY Control System ESifh tdrfaxmifrIvdktyfcsuf awG udktaxmuftuljyKEdkifNyD;? puf&Hk?tvkyf&HkawGomru "mwfcGJcef;awG?aq;&HkawG&JU Cooling System, Venlation tp&SdwJh Performance taeESifh ygtoHk;jyKvmEdkifygw,f/

2/ **SCADA System udkatmufygtwdkif; yHkpH(3) rsdK;eJYwnfaqmufEdkifygw,f/**

(u) D+R+N (Development+Run+Networking) vdkUac:wJh uGef,uf awGcsdwfquf?wnfaqmufNyD;vkyfaqmifjcif;?

(c ) R+N (Run+Networking) vdkUac:wJh uGef,uf awGcsdwfquf vkyfaqmifjcif;?

(\*) Factory Focus vdkUac:wJhpuf&Hk? tvkyf&HkawG&JU t"dutcsuftcsm tjzpf wnfaqmuf jcif;wdkUjzpfygw,f/

3/ **t\*Fg&yfrsm;(Feactures of SCADA)**

SCADA Control System wGift\*Fg&yfrsm;taejzifh atmufygtwdkif; (10)ck&Sdygonf-

(u) Dyanamic process Graphic

(c) Alarm Summery

(\*) Alarm History

(C) Real time trend

(i) Historical time trend

(p) Security (Application Security)

(q) Data base connectivity

(Z) Device connectivity

(ps) Scripts

(n) Recipe management wdkUjzpfygw,f/

4/ **Manufacture of SCADA(xkwfvkyffonfhae&mrsm;)**

Modicon (Telemeconique) Visual look

Allen Bradly: RS View

Siemens: win cc

Gefanc:

KPIT:ASTRA

Intelution:Aspic

Wonderwave:Intouch wdkUjzpfygw,f/

5/ **Evolution of SCADA (rsdK;qufrsm;)**

SCADA system onf atmufygtwdkif; rsdK;quf(4)ck ajymif;vJjzpfay:cJhw,f/

(u) **First Generation(Monolithic)/** tapmqHk;xGuf&Sdvmaom SCADA System onf Network System ryg&Sdao;aMumif;awGU&Sd&onf/

(c ) **Second Generation(Distributed)/** þ Generation wGif Lan csdwfqufrI pepfyg0ifvmNyD;? Information & command process rsm;tm; multiple Station rsm;odkYjzefYusufvkyfaqmifvmEdkifonfudk awGU&onf/ odkUaomf Security ydkif;wGiftm;enf;aeao;onf/

(\* ) **Third Generation(Networked)/** Third Generation wGif Lan Network wpfckxufydkrdkyg0ifNyD; Process control network (PCN) wpfck jzpfvmcJhonf/

(C) **Fourth Generation(Internet of Things)/** Fourth Generation tydkif;wGif Maintaince & Integration tydkif;rsm;yg0ifvmNyD; Instruction & Components rsm;onfvnf; ydkrdk Economically jzpfvmcJhonf/ xdkYjyif Data rsm;vnf; Real Time tcsdefESifhwajy;nD Control jyKvkyfvmEdkifwmudkawGU&ygw,f/

6/ **SCADA Architecture (zGJUpnf;wnfaqmufjcif;)**

SCADA System [m NyD;jynfhpHkwJh Control System wpfckawmhr[kwfyg?odkYaomf Control System wpfckvHk;udkxdef;ausmif;ay;Edkifrnfh Software package wpfckjzpfygw,f/ NyD;jynfhpHkwJh System wpfckjzpf&eftwGuf Hardware Module awGeJYcsdwfqufay;EdkifwJY PLC Control, RTUs(Remote Terminal Units) rsm;? Sensor rsm;? Human-Machine Interface System rsm;? Networking System rsm;jzifhaygif;pyftoHk;jyK&efvdktyfygw,f/ Hardware rSm Cilent Layer vdkYac:wJh vlawGESifhpufawG&JUwHkUjyefrI? Data sever Layer vdkUac:wJh Control System awGyg0ifygw,f/¤if; Cilent Layer ESifh Data Server Layer wdkUudk Networking taejzifh Lan ,Ethernet rsm;jzifhcsdwfqufxm;ygw,f/ Software Architecture taeESifh Server wpfck(odkU)wpfckxufydkwJh Server awGuae tcsdefESifhwpfajy;nDjzpfaewJh tajccH Data awGudk apmifhMunfhjcif;? a&G;cs,fjcif;? wGufcsufjcif;? alarm check jyKvkyfjcif;rsm;udk csdwfqufvkyfaqmif&rSmjzpfygw,f/ xdkodkUaqmif&Guf&mwGifvlESifhpufaomf vnf;aumif;? Server tcsif;csif;aomfvnf;aumif; csdwfquf&rSmjzpfygw,f/

RTUs pepfwGif telementry hardware ydkif;yg0ifNyD; digital data rsm;udk ay;ydkUEdkifonf/ xdkUtjyif Supervisory control rSay;ydkUonfh digital command rsm;udkvnf;vufcHNyD;xdef;odrf;xm;Edkifonf/ PLCs pepfwGifvnf; RTUs pepfuJhodkUyif jyKvkyfEdkifNyD; RTUs pepfxufydkíaumif;rGefonf/ PLCs onfwpfckxufydkaom Input/Output Data rsm;udk Programmable Language toHk;jyKí command ay;EdkifNyD; ydkrdkwdusonf/xdkUjyif Flexiable jzpfjcif;?aps;EIef;t&vnf;wGufacsudkufjcif;ponfh tusdK;aus;Zl;rsm;vnf;&&Sdaponf/

Human-Machine Interface(HMI) qdkonfrSm Human operator monitors ESifh SCADA csdwfqufxm;aom Field Device twGif;rS Process Data rsm;tjyeftvSefcsdwfqufxm;jcif;jzpfonf/ HMI onf System Data Base ESifh Program Data rsm;udk Supporting jyKvkyfay;jcif;jzpfonf/

**7/ MODERN SCADA SYSTEM**

PLC (Programmable logic controller)rsm;onf,ckacwfumvwGif puf&Hk?tvkyf&Hkrsm;wGif us,fus,fjyefYjyefY toHk;jyKvmMuonfudk awGU&onf/ xdkYjyif puf&Hk? tvkyf&Hk rsm;wdk;wufvmonfhtm;avsmfpGm Control system twGuf Controller rsm;ydkrdk vdktyfvmygw,f/ xdkYjyif Control System ESifh Controller rsm;onfvnf; t&G,ftpm; ydkrdk ao;i,fvmwmudkawGU&ygw,f/

PLC/DCS SCADA System \tm;omcsufrsm;rSm-

* Computer jzifhtvGefrsm;jym;wJY Data tcsuftvufawG ukd rSwfom; xm;Edkif ygw,f/
* tcsuftvuf Data awGudk User awGtaejzifh rnfonfhenf;jzifhrqdk jyoEdkfifygw,f/
* ¤if; Area wavQmufvnf;axmifaygif;rsm;pGmaom senser awGESifh system udkcsdwfqufEdkifygw,f/
* Operator onfvnf; rSefuefaom Data tcsuftvufawGudk Added jyKvkyfay;Edkifygw,f/
* Data Type awGudkvnf; RTUs rSpkpnf;EdkifrSmjzpfygw,f/
* Data awGudk &IaxmifhtrsdK;rsdK;rSjrifEdkifygw,f/

**tm;enf;csufrsm;rSm-**

* System onf panel &Sd sensor rsm;xufydkí&IyfaxG;apw,f/
* operator skill rsm;vnf;vdktyfygonf/ (Oyrm- system analysis programmer ).
* Sensor rsm;csdwfquftoHk;jyK&ef Wiring System rsm;vdktyfygw,f/

8/