Staying focused on applications of highly accurate industrial CNC-systems, at the end of 1990s, PWI, in co-operation with the Institute of Problems of Mathematical Machines and Systems of the NAS of Ukraine, developed software tools, allowing an operator to use the so-called visual method for designing EBW programs for complex constructions. In addition to traditionally used computer system, which is a combination of CNC and PLC, the following is introduced:

- An additional computer, which independently of other processor nodes, solves the problems of butt joint recognition by workpiece surface image received from RASTR tracking equipment, and jointly with HMI computer, provides the functions of automatic teaching, correction and tracking the butt joint.

- Higher level of HMI (Human machine interface)—an operator’s interface for visual design of operating programs and control of the welding process;

**Hardware Architecture of Computer Control System**