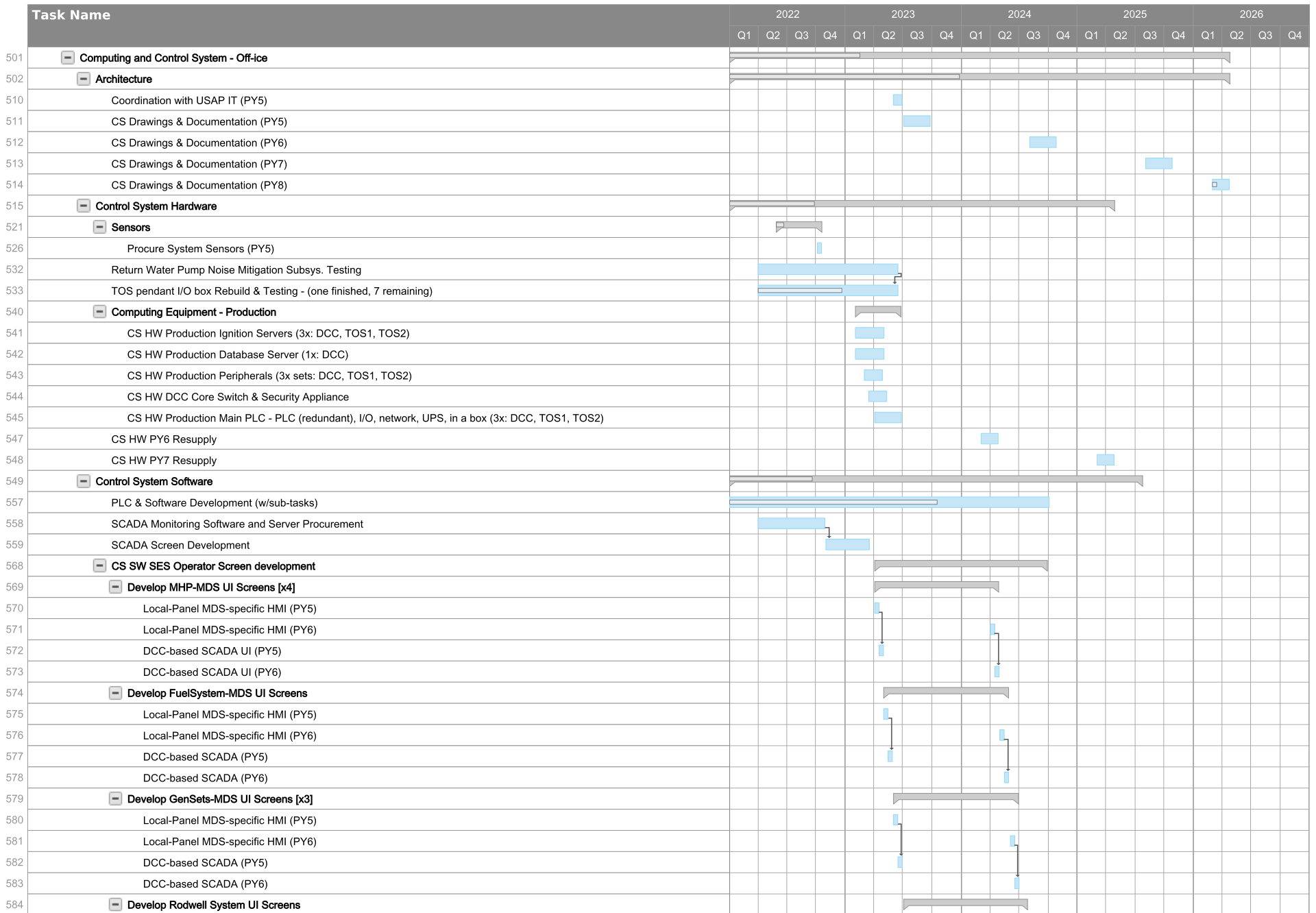


# Rebaseline Schedule PY5-PY8



Task Name	2022				2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
585																				
586																				
587																				
588																				
589																				
590																				
591																				
592																				
593																				
594																				
595																				
596																				
597																				
598																				
599																				
600																				
601																				
602																				
603																				
604																				
605																				
606																				
607																				
608																				
609																				
610																				
611																				
612																				
613																				
614																				
615																				
616																				
617																				
618																				
619																				
620																				
621																				
622																				
623																				
624																				
625																				
626																				
627																				
628																				

Task Name	2022				2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
632	Programming and Testing at PSL																			
634	- E-Stop System																			
640	E-Stop Resupply (PY6)																			
641	E-Stop Resupply (PY7)																			
642	- Drill Control Center																			
643	Computing System																			
645	Update Workspace (desk, chairs), Procure Printer & Accessories																			
646	- Outdoor Cables																			
649	Fabricate and Test SES & SES to TOS Cables - Signal																			
650	CS Cabling Resupply (PY6)																			
651	CS Cabling Resupply (PY7)																			
652	- Controls Subsystems (PY5-PY8)																			
653	- CS MHPs																			
658	- CS MHP HW2-3: Heater Controller Temp Displays & Controllers																			
659	Procure sample temperature display and digital thermostat, install in test bed heater, test																			
660	Select and procure temperature display units for heater controls, conversion hardware																			
661	Replace temperature display units, remove RTD DGHs, transfer net connections, test																			
662	Select and procure digital thermostats for heater controls, conversion hardware																			
663	Write thermostat field replacement procedure																			
664	- CS MHP HW4-6: Maintain Documentation, Prepare Field Plans																			
665	Write rewiring and test instructions for MHP E-stop boxes (fixes switch contact selections made in Gen 1)																			
666	Write test procedures for dry heater tests																			
667	Assemble equipment to test flow meters (excitation coil and portable pulse generator)																			
668	Write flow meter test procedure and assemble test kit																			
670	- CS MHP SW: Develop PLC-MHP MDS SW Functionality [Entire MHP system]																			
671	Develop heater-based sensor readout; (heater temp/flow manifold pressures)																			
672	Develop environmental sensor readout; (bldg temps, smoke, e-stop)																			
673	Develop heater control; (ON/OFF, Thermostat setpoint)																			
677	Implement interlocks																			
678	Document Subsystem																			
679	CS MHP HW ready to pack for shipment																			
680	- CS PHS & WT2																			
681	- CS PHS HW1: Motor Drive Config & Install Kits																			
683	Configure VFDs with accessories, connection pigtails, document																			
684	Develop VFD installation strategy & document, procure materials																			
688	- CS PHS HW3: Network Box Refurb & Config																			
690	Select and procure new power supplies for the network box, procure one RS-485 gateway																			
691	Redesign and rebuild PHS network box with new I/O, document as-built configuration																			
692	Indicate where approximately 20 sensor and network cables terminate in PHS and document config. plans																			
693	Configure heater-mounted DGH modules, develop and document DGH installation and test plans																			
694	CS PHS HW4: New E-stop Slap Switch & Box for Outdoor Location																			
695	CS PHS HW5: Develop heater test procedures, configure test tools, document test plans																			
701	- CS PHS HW7-8: Maintain Documentation, Prepare Field Plans																			
702	Develop and document test plans for all PHS system components																			

Task Name	2022				2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
703	Review Gen-1 docs, identify where sensor connections terminated, plan for reconnection and test																			
704	<b>[-] Develop PLC-PHS MDS SW Functionality</b>																			
705	Develop heater-based sensor readout; (heater temp/flow manifold pressures)																			
706	Develop environmental sensor readout; (bldg temps, smoke, e-stop)																			
707	Develop water tank sensors readout																			
708	Develop heater control; (ON/OFF, Thermostat setpoint)																			
709	Develop AB drive/pump control; (variable speed velocity drives)																			
710	Configure/document network switch																			
711	Configure/document RTA gateway to M-DGH interface																			
712	Configure/document Point I/O Block																			
713	Configure/document M-DGHs (Heater-mounted + all others)																			
714	Implement interlocks																			
715	Document Subsystem																			
716	CS PHS HW ready to pack for shipment																			
717	<b>[-] CS TOS &amp; Reels</b>																			
718	<b>[-] CS TOS HW1: Motor Drive Config &amp; Install Kits</b>																			
720	(PY4) Configure VFDs with accessories, connection pigtails, document																			
721	Configure VFDs with accessories, connection pigtails, document																			
722	Develop VFD mechanical and electrical installation strategies & document, procure materials																			
723	SW configuration and autotuning, make plan - MDCR/LW, DSHR/LW, RWHR, RWCR, Tower Hoist																			
724	<b>[-] CS TOS HW2: Estop</b>																			
726	Document changes to E-stop and Reel stop interfaces to motor drives, procure materials, implement																			
727	Test refurbished E-stop panels with reel safety junction boxes, I/O boxes, network boxes, drives																			
728	Develop and document E-stop switch re-wiring plans for TOS, procure spare slap switches																			
729	(PY4) Design new E-stop controllers for TOS, build and test boxes																			
730	Design new E-stop controllers for TOS, build and test boxes																			
731	<b>[-] CS TOS HW3: Network &amp; PLC</b>																			
732	Spec and procure new power supplies for TOS network boxes, procure DGH gateway, document changes																			
733	Document plans for TOS network box upgrades, specify and procure tools and materials																			
734	Spec TOS network switch location, spec cables to drives, I/O boxes, network box, DCC modem, PC, PLC, e-stop controller																			
735	Design enclosures for TOS PLCs and attached I/O used for payout encoders, load cells; procure parts																			
736	Construct enclosures for TOS PLCs and attached I/O, test																			
737	<b>[-] CS TOS HW4: I/O Boxes</b>																			
739	Test I/O boxes with pendants and motor drives																			
740	Design and build cables for I/O box connections to motor drives and E-stop box																			
741	Rebuild two portable I/O boxes, test (used to operate return water cable reel motor drives with pendant)																			
742	<b>[-] CS TOS HW5-6: Maintain Documentation, Develop Field Plans</b>																			
743	Develop and document on-ice test plans for E-stop, Reel-Stop, and Fault Detection hardware																			
744	Develop and document on-ice test plans for integrated hardware																			
745	<b>[-] CS TOS HW7: Tower Payout Encoders &amp; Load Cells</b>																			
747	Test load cells and payout encoders with PLC, verify functionality required for payout control, load sharing																			
748	CS TOS HW8: Line Filters for All Drives in TOS2, Identify and Procure																			
749	CS TOS HW9: Tower Hoist Reconnect Materials TOS2, Identify and Procure																			

Task Name	2022				2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
750 CS TOS HW10: Review deployment plans and HW, integrate with drill																				
751 <b>- CS TOS Develop PLC Space SW Functionality</b>																				
752 Develop general control/monitoring software																				
753 Develop reel control software(MCR/LW, DSHR/LW, RWHR, RWCR, Tower Winch)																				
754 Develop tension-sharing algorithm software (MCR/LW, DSHR/LW)																				
755 Develop drillhead data monitoring interface)																				
756 Configure/document network switch																				
757 Configure RTA gateway to M-DGH interface																				
758 Configure M-DGHs																				
759 Implement interlocks																				
760 Document Subsystem																				
761 CS TOS HW ready to pack for shipment																				
762 <b>- CS Drillheads (CS HW, not actual drillheads)</b>																				
763 CS HW Drillhead software/hardware production version																				
764 <b>- Develop Linux SW Functionality</b>																				
765 Port C-Lang ingest process to rPI platform & test																				
766 Integrate rPI platform into PLC infrastructure																				
767 Document Subsystem																				
768 CS Drillheads HW ready to pack for shipment																				
769 <b>- CS DCC, WT1, and Fuel Daytank</b>																				
770 Design, construct and test master E-stop controller, produce documentation and user instructions																				
771 Design and construct general-purpose I/O box for fuel sled, gather required component stock to install																				
772 Procure 20 kW three-phase heater for DCC and 208V breakers																				
773 WT1 VT pump drives: procure, configure, rewire plan																				
774 WT1 VT pump drives: final configure																				
775 WT1 VT pump drives: install plan and kit																				
776 <b>- Develop PLC-Fuel DayTank SW Functionality</b>																				
777 Develop fuel system sensor readout ; (multi-level tank status, control relay status )																				
778 Configure/document Point I/O Block																				
779 Document Subsystem																				
780 Implement interlocks																				
781 CS DCC HW ready to pack for shipment																				
782 <b>- CS Gensets</b>																				
783 CS Gensets HW - identify, procure, assemble																				
784 <b>- Develop PLC-Gens MDSs SW Functionality</b>																				
785 Develop sensor readout; (bldg temps, fuel temps, supply/return water temps)																				
786 Develop sensor readout; (engine jacket temps, exhaust temps, drip pan status)																				
787 Configure/document network switch																				
788 Configure/document RTA gateway to M-DGH interface																				
789 Configure/document M-DGHs																				
790 Document Subsystem																				
791 CS Gensets HW ready to pack for shipment																				
792 <b>- CS HPP</b>																				
793 <b>- CS HPP HW1: Motor Drive Config &amp; Install Kits</b>																				

Task Name	2022				2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
794				Procure HPP motor drives (four PF-755 50 hp vfds) (8 hours, task is finished)																
795				Configure four HPP VFDs with accessories, connection pigtails, document																
796				Develop VFD mechanical and electrical installation strategies & document, procure materials																
797				SW configuration and autotuning																
798				<b>CS HPP HW2: Signal and Readout Definition, Procedures</b>																
799				Define requirements and procedures for reading signals applied to HPP motor drives																
800				Define method of verifying sensor readout accuracy (reading vs stimulus)																
801				Develop and document test procedures for on-ice personnel																
802				<b>CS HPP HW3: PLC Hardware, Box Build, Testing</b>																
803				Define core HPP PLC functions and requirements, define needed I/O connections																
804				Select PLC, Enclosure, Power supplies, I/O expansion cards, power distribution, connectors and cables																
805				Design and Construct PLC enclosure																
806				Test HPP PLC enclosure with HPP Network box																
807				<b>CS HPP HW4: Charge Pump Motor Controllers</b>																
808				Install PF-70 motor drive in test bed, configure with local control system, test																
809				Procure additional drives for charge pumps (4), AC and network pigtail materials																
810				Connectorize four drives with power and network pigtails, test each in test bed																
811				<b>CS HPP HW5: Sensor Box Reconfig &amp; Test</b>																
812				Build and test a portable network box for sensor box testing (Gateway, power supply, connectors)																
813				Procure and configure test equipment needed to calibrate individual sensors, provide user instructions																
814				Connect HPP sensor readout box with sensor box, connect to network box, test all sensors and document																
815				CS HPP HW6: Sensor Box DGH Reconfig & Test																
816				<b>CS HPP HW7: E-stop box Re-outfitting</b>																
817				Select and procure E-stop relays for pump VFD Enable signals																
818				Develop and document rewiring instructions for HPP E-stop box																
819				<b>CS HPP HW8: Network Box Refurb &amp; Config</b>																
820				Select and procure a wall-mount managed Ethernet switch for the HPP electrical closet																
821				Select and procure new power supplies for the network box, procure one RS-485 gateway																
822				Refurbish the HPP network box, document as-built configuration																
823				Select and procure HPP network switch enclosure, integrate with switch																
824				<b>CS HPP HW9-10: Maintain Documentation, Prepare Field Plans</b>																
825				Develop and document test plans for all HPP system components																
826				Review Gen-1 docs, identify where sensor connections terminated, plan for field integration and test																
827				<b>Develop Local HPP PLC SW Functionality</b>																
828				Develop water path sensor readout; (pressure, temp, flow)																
829				Develop environmental sensor readout; (bldg temps, smoke, e-stop)																
830				Build shared data-tagging w/ DCC core controller																
831				Develop AB drive/pump control; (variable speed velocity drives)																
832				Develop charge pump control; (variable speed velocity drives OR Soft Starter)																
833				Configure/document network switch																
834				Configure/document RTA gateway to M-DGH interface																
835				Configure/document M-DGHs																
836				Implement interlocks																
837				Document Subsystem																

Task Name	2022				2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
838 CS HPP HW Ready to Pack for Shipment																				
839 <input type="checkbox"/> CS ARA Rodwell System																				
840 <input type="checkbox"/> CS ARA Rodwell System HW																				
845 Select and procure new hardware to capture flow sensor pulse rates (A-B I/O hardware)																				
846 Design and Build network cable, E-stop cable, for connecting rodwell system to drill system																				
847 <input type="checkbox"/> Develop PLC-Rodwell SW Functionality																				
848 Develop ARA-drill sensor readout; (heater flows, head press, tank level)																				
849 Develop AB drive/pump control; (variable speed velocity drives)																				
850 Configure/document Point I/O Block																				
851 Configure/document network switch																				
852 Configure/document RTA gateway to M-DGH interface																				
853 Configure/document M-DGHs																				
854 Implement interlocks																				
855 Document Subsystem																				
856 CS ARA HW Ready to Pack for Shipment																				