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APC READINESS CHECKLIST (SELF-ASSESSMENT)

Advanced Process Control (APC) / Model Predictive Control (MPC) / Optimization Layer
Version: 1.0
Audience: Production, Process Engineering, Automation, Operations, Plant Management
Region focus: DACH (Germany / Austria / Switzerland)

WHAT THIS IS

This checklist helps you quickly assess whether your plant, machine, or production line is ready for an APC project (e.g., MPC with constraints, multivariable control, soft sensors, setpoint optimization, supervisory control).
APC typically delivers:
• Higher throughput (while respecting constraints)
• Better quality consistency (lower variability)
• Lower energy consumption per unit product
• Fewer alarms and less operator “firefighting”
• More robust operation under disturbances

HOW TO USE IT

For each item, mark:
YES = ready
PARTLY = possible but needs small fixes
NO = not ready yet (but can be made ready)
You can use the scoring section at the end to estimate readiness in 2 minutes.

SECTION 1 — BUSINESS GOAL AND SUCCESS CRITERIA

1.1 We have one clear primary goal (energy, throughput, quality, scrap, stability, changeover time).
YES / PARTLY / NO
1.2 We can express the goal as measurable KPIs with units (e.g., kWh/t, t/h, % scrap, σ of key quality).
YES / PARTLY / NO
1.3 We can define a baseline period (e.g., last 3–12 months) and measure improvement against it.
YES / PARTLY / NO
1.4 We know what improvement is “worth it” (rough ROI / payback expectation).
YES / PARTLY / NO

SECTION 2 — PROCESS UNDERSTANDING AND OPERATING MODES

2.1 The main disturbances are known (raw material variation, ambient conditions, wear, batch changes, etc.).
YES / PARTLY / NO

2.2 Operating modes are clear (startup, steady, grade change, cleaning, shutdown, etc.).
YES / PARTLY / NO
2.3 Key constraints are known and documented (safety, quality, equipment, emissions, torque/pressure/temperature limits).
YES / PARTLY / NO
2.4 We can list likely controlled variables (CVs) and manipulated variables (MVs).
YES / PARTLY / NO

SECTION 3 — SENSORS AND ACTUATORS (CONTROL-GRADE REALITY)
3.1 Critical sensors are maintained and stable (calibration routines exist; failures are detected).
YES / PARTLY / NO
3.2 Sensor sampling time, filtering, noise, and drift are known (or can be determined).
YES / PARTLY / NO
3.3 Actuators are suitable for closed-loop control (valves/drives/dampers): deadband, stiction, saturation are acceptable or at least known.
YES / PARTLY / NO
3.4 We can safely run step tests or planned small excitations (even limited windows).
YES / PARTLY / NO

SECTION 4 — DATA AVAILABILITY AND QUALITY (OFTEN THE TRUE BOTTLENECK)
4.1 Data is available in historian/SCADA/PLC logs with sufficient resolution for the process dynamics.
YES / PARTLY / NO
4.2 Tags are identifiable; units are known; timestamps are reliable.
YES / PARTLY / NO
4.3 Manual interventions, recipe changes, downtime, and mode switches are logged (or reconstructable).
YES / PARTLY / NO
4.4 Data export is feasible (CSV / SQL / API / OPC UA / historian export) with reasonable effort.
YES / PARTLY / NO

SECTION 5 — CONTROL SYSTEM INTEGRATION (CAN WE DEPLOY THIS SAFELY?)
5.1 We know where APC will live: PLC/DCS + supervisory/APC layer (architecture is feasible).
YES / PARTLY / NO
5.2 There is a safe method to apply APC outputs: setpoints/biases with limits, bumpless transfer, and fallback.
YES / PARTLY / NO
5.3 Existing PID/cascade loops are reasonably tuned (or at least not unstable).
YES / PARTLY / NO
5.4 A realistic control interval is agreed (e.g., 1 s / 5 s / 30 s / 5 min) appropriate for the process.
YES / PARTLY / NO

SECTION 6 — SAFETY, INTERLOCKS, AND “PERMISSION TO CHANGE”
6.1 Safety functions and interlocks are documented and will remain authoritative.
YES / PARTLY / NO
6.2 An override philosophy exists (operator can always take over; clear “APC on/off” states).
YES / PARTLY / NO
6.3 Management-of-change (MOC) is feasible for a pilot (even in a lightweight form).
YES / PARTLY / NO
6.4 We can implement a phased approach: Advisory → Closed-loop → Higher autonomy.
YES / PARTLY / NO

SECTION 7 — OPERATIONS AND PEOPLE (WHERE APC PROJECTS WIN OR FAIL)
7.1 A process owner is assigned who can decide quickly and remove blockers.
YES / PARTLY / NO
7.2 Operators are involved early and practical constraints are respected.
YES / PARTLY / NO
7.3 A training/hand-over plan exists (“what to do when it looks wrong”).
YES / PARTLY / NO
7.4 Commissioning/test windows can be scheduled without unacceptable production risk.
YES / PARTLY / NO

SECTION 8 — IT/OT AND CYBERSECURITY (BE EXPLICIT)
8.1 Network access path is clear (segmentation, DMZ, OPC UA/DA, VPN policy, etc.).
YES / PARTLY / NO
8.2 Remote support is allowed, or an on-site alternative is feasible.
YES / PARTLY / NO
8.3 User roles, logging, backups, and patch policy are defined for any APC components.
YES / PARTLY / NO
8.4 Data protection requirements are clear (internal policies, customer requirements).
YES / PARTLY / NO

SECTION 9 — PROJECT SETUP AND GOVERNANCE
9.1 Named contacts exist for process, automation, operations, and IT/OT.
YES / PARTLY / NO
9.2 Time can be allocated for workshops, data review, and pilot testing.
YES / PARTLY / NO
9.3 Acceptance criteria are agreed (KPIs, constraint compliance, stability, operator usability).
YES / PARTLY / NO
9.4 There is a path from pilot to rollout (ownership, maintenance, scaling plan).
YES / PARTLY / NO

SCORING (SIMPLE AND HONEST)
Assign points:
YES = 2
PARTLY = 1
NO = 0
Total score (max 72): _____
Interpretation:
• 54–72: Ready for an APC pilot now. Start with the highest ROI loop.
• 36–53: Close. Do a short “readiness sprint” (data/instrumentation/integration gaps) and then pilot.
• 0–35: Foundations first. This is common and usually quick to improve with a structured plan.