

PRODUCTION RAMP-UP

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INTRODUCTION

For all of us, the current situation is a never encountered challenge — in particular for our plants. They have first of all to ensure our associates' health, compliance with legal requirements and then ensure the deliveries and quality for our customers.

Therefore, we have merged a cross-functional collection of good practices, how to handle the ramp-up of our plants in best interest of our associates and customers. In particular, this overview provides recommended actions for Covid-19-specific topics and is also based on experience from China.

GENERAL APPROACH

Step 1: Conduct risk assessment based on different aspects

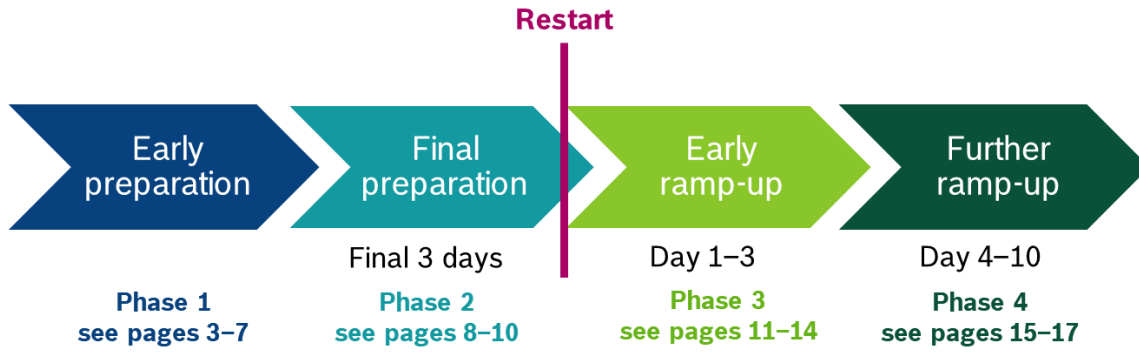
- ▶ **People and health:** personal safety, build up trust and commitment of all associates
- ▶ **Legal requirements:** ensure compliance with all applicable emergency orders and regulations regarding operations, health, safety, and personal protective equipment
- ▶ **Business continuity:** fulfillment of customer demands, stabilizing international production network worldwide, ensuring delivery performance to support customer recovery
- ▶ **Financial impact:** strict focus on costs and liquidity. Saving measures in all cases to be considered and applied wherever possible

Step 2: Ensure regional pre-conditions for ramp-ups

- ▶ **Harmonized approach for all sites per country** based on national standards or official best practices
- ▶ **Establish a hotline** within the division to support plants with their specific questions
- ▶ **Coordination with works council** to build acceptance and trust
- ▶ **Mandatory self-audit and clearance by local medical services and the health, safety, and environment department** prior to release of a site (4-eye-principle)
- ▶ **Right of veto by head of legal entity** for the release if pre-conditions especially concerning health or legal requirements are not respected
- ▶ **Establish a local core team** to safeguard an effective ramp-up
- ▶ **Comply with customer-specific requirements**, esp. new requirements regarding Covid-19 issues
- ▶ **Speed, decisions, discipline, and consequence are key** – act according to the following principles:
 - 1) Our number-one priority is our associates' health
 - 2) Take and document underlying basis for decisions; involve your local management and our customers
 - 3) As soon as possible, return to the standard

Covid-19 Guideline ramp-up

Step 3: Prepare ramp-up with phase-based approach



PHASE 1: TRANSITION & EARLY RAMP-UP PREPARATION

Leadership Team

Task	Function	Materials & good practices
1. Ensure ongoing hygiene measures	Plant Mgmt., Leadership Team, Health/Safety	Post hygiene tip posters in highly frequented areas
2. Establish local emergency response team if not already done	Plant Mgmt.	
3. Plant Management visibility on site for associates in plant	Plant Mgmt.	
4. Continuous alignment with works council	Plant Mgmt., HR	
5. Prepare ramp-up rules with works council (behavior, masks, shift handover, optional temperature checks, etc.)	Plant Mgmt., HR, Health/Safety	
6. Prepare value stream / shift ramp-up plan	Plant Mgmt., MSE, Logistics, Quality	
7. Define short-work areas ("Kurzarbeit")	Plant Mgmt., Leadership Team, HR	
8. Establish intranet community	Plant Mgmt., Leadership Team, COMM	Create an intranet group chat
9. Daily alignment between regional team (new Covid-19 cases, customer coverage etc.)	Plant Mgmt.	
10. Follow measures in case of infections	Plant Mgmt., Leadership Team, Medical	
11. In case of infections, record and report contact persons, send in quarantine	Plant Mgmt., Leadership Team, Medical	
12. Define communication on shop floor (shift handover, staff info)	Plant Mgmt., Leadership Team	
13. Define indirect associates in plant / home office	Plant Mgmt., Leadership Team, HR	
14. Establish sectors to limit access to different areas	Plant Mgmt., Facilities	

Associates

Task	Function	Materials & good practices
1. Strictly follow hygiene regulations	All associates	
2. Strictly follow social distancing	All associates	
3. Strictly follow meeting policy	All associates	
4. Strictly follow advice for people with higher risk	All associates	
5. No shift overlap/separate break rooms	All associates	
6. No collective trainings	All associates	

Site environment control

Task	Function	Materials & good practices
1. Ensure that hygiene rules are applied (e.g. disinfection)	Plant Mgmt., Facilities, Health/Safety	
2. Install temperature control at the gates, if required by local regulations	Plant Mgmt., Security Service	
3. Prepare and define food supply for associates	Plant Mgmt., Canteen Service	Lunchboxes, vending machines
4. Define how to hand out personal protective equipment	Plant Mgmt., Health/Safety	
5. Define parking spaces (in case all staff enter through main gate)	Plant Mgmt., Security Service	
6. Close revolving gates ("Drehkreuztore") in case of installed temperature controls (optional)	Plant Mgmt., Security Service	
7. Allow no external visitors on site	Plant Mgmt., Security Service	
8. Ensure working distance according to local regulation (e.g. >1.5m in Germany), identify working places where distance cannot be ensured	Plant Mgmt., Leadership Team, Health/Safety	
9. Define break rooms allowing appropriate distance, plan staggered breaks	Plant Mgmt., Leadership Team, Health/Safety	
10. Define canteen rules (if still opened). Define measures for eating, seating etc.	Plant Mgmt., Health/Safety	
11. Checklist and documentation for cleaning to create transparency etc.	Plant Mgmt., Facilities	
12. Ensure regular disinfection of commonly used facilities (handles, handrails, canteen, company cars, and tools, e.g. tool box, mobile inspection, measurement and test equipment)	Plant Mgmt., Facilities, Health/Safety	

13. Increase ventilation of workplace. Filters of aircon and ventilation systems should be checked and changed in shorter intervals	Plant Mgmt., Facilities	
14. Establish disinfection dispensers at entrance gates, entrances of buildings, break rooms, toilets etc.	Plant Mgmt., Facilities, Health/Safety	
15. Disinfection of areas with suspected or active case occurrence	Plant Mgmt., Leadership Team, Health/Safety, Facilities	
16. Define rules for changing rooms, close showers if necessary	Plant Mgmt., HR, Health/Safety, Facilities	
17. Ensure plant security, define entrance rules for associates & externals to the plant	Plant Mgmt., Leadership Team, Health/Safety, Security Service	
18. Ensure emergency supply (e.g. power, compress air, telephone, nitrogen)	Plant Mgmt., Facilities	

Communication

Task	Function	Materials & good practices
1. Regularly inform all staff at home about latest developments and possible begin of ramp-up (building up community spirit and commitment)	Plant Mgmt., HR, COMM	Communication to associates without company device (intranet) Example: weekly e-mails to private e-mail addresses, regular intranet group messages, other established channels available to shift supervisors/teams
2. Continue to offer a channel for feedback, questions, and concerns from associates	Plant Mgmt., HR, COMM	Example: mailbox for questions, local Corona hotline
3. Inform external partners about planned ramp-up (logistics and others)	Plant Mgmt., Logistics, Quality	
4. Prepare message to associates for ramp-up day; focus on customer situation, Covid-19 cases in plant, prevention measures	Plant Mgmt., HR, COMM	
5. Prepare other communication materials for ramp-up (posters, screens, etc.)	Plant Mgmt., HR, COMM, Medical	
6. Stick up posters with hygiene rules, code of conduct, etc.	Plant Mgmt., HR, COMM	
7. Inform and collaborate closely with local authorities	Plant Mgmt.	
8. Daily conference call regional team	Plant Mgmt.	

Value Stream Management

Task	Function	Materials & good practices
1. Regularly review OEM shutdown list and customer call offs for short-term changes or demand. Document call-offs as base for discussions in case of short-term increases.	Logistics	
2. Prepare alternatives for production processes in good time in case suppliers should fail. Changes in production procedures due to distance and hygiene rules?	Manufacturing, Quality	
3. Announce freight quotas for ramp-up in good time to TMC (bottlenecks or blocked transportation routes to be expected). Inform TMC and Non-TMC about ramp-up plan.	Logistics	
4. Rework CDD (confirmed delivery dates) and planned production orders in SAP. If applicable, check support in the IPN (transfer part numbers). Update production plan to discuss shift planning with relevant parties (e.g. manufacturing, physical Logistics, maintenance). Setup in house transportation.	Logistics, Manufacturing, Quality	
5. Work organization to be adapted to hygiene rules and social distancing (temporal and spatial sectoring, shift extension, bottleneck processes). All tests still to be carried out.	Plant Mgmt., Leadership team, Health/Safety	
6. Increased training to be carried out due to expected higher sickness rate and changed work contents. Focus on check items of Layered Process Confirmation (LPC).	Plant Mgmt., Manufacturing	
7. Check expiry dates of relevant materials, auxiliary and operating materials before ramp-up (coolant, lubricants, wash media, adhesives). Start equipment which needs a start-up phase in good time.	Manufacturing, Logistics	
8. Regular short cycled contact to critical suppliers, sub suppliers and “external workbenches”. Create an overview on supply capabilities.	Logistics	
9. Define procedure for forwarders, special transportations and parcel services (social distancing)	Logistics, Health/Safety	
10. Check timely limited concessions incl. risk assessment. Lean approval process e.g. by Quality team and value stream manager. Recommendation: harmonized approach in the business unit; avoid formalism. Identify and plan increased inspection needs (for batch releases, sampling inspections). Changes / change requests should not be carried out until safe ramp-up is managed	Quality, Manufacturing	

<p>11. Initiate a ramp-up evaluation e.g. by LPC (prioritization to bottleneck stations, stations with high failure rate or new associates). Additional measures and extended sample size to be planned for ramp up. Poka Yoke systems working? Analyze failures promptly.</p>	<p>Plant Mgmt., Manufacturing, Quality</p>	
<p>12. Are machines sufficiently prepared for the ramp-up? Are maintenance intervals covered? Use downtimes for maintenance activities if possible. Take different ramp up times into account. Prepare enhanced HSE measures (e.g. fire brigade).</p>	<p>Manufacturing, Health/Safety</p>	
<p>13. Are measurement inspection and test equipment (MIT) calibration intervals covered? Are there critical/sensible MIT equipment / inspection processes? If yes, calibrate before ramp-up (first produced parts OK).</p>	<p>Quality</p>	
<p>14. Core teams for function of IT infrastructure (key users, emergency staffing). Clarify escalation for services. Contact in the plant to be defined and available.</p>	<p>IT</p>	
<p>15. Check inventories of direct/indirect material, esp. packaging material (if applicable agree on alternative packaging)</p>	<p>Logistics</p>	

PHASE 2: FINAL RAMP-UP PREPARATION

Leadership Team

Task	Function	Materials & good practices
1. Inform all associates about ramp-up	Plant Mgmt., Leadership Team, HR, COMM	Ensure information flow through private e-mails or phone numbers Communication to associates without company device (intranet) See also section "communication" below
2. Communicate result of alignment with works council	Plant Mgmt. HR	
3. Check availability of associates/capacity per Line	Plant Mgmt, Leadership Team	
4. Check availability of leadership team	Plant Mgmt.	
5. Monitor customer/supplier situation	Plant Mgmt., Logistics, Quality	

Site environment control

Task	Function	Materials & good practices
1. Temperature check equipment in place and people are trained, if required by local regulation	Plant Mgmt., Security Service	
2. Check that personal protective equipment are in defined area and handling instruction is available	Plant Mgmt., Leadership Team, Health/Safety	
3. Mark parking place/entrance with hint who has to park where	Plant Mgmt., Security Service	
4. Ensure revolving gates are closed	Plant Mgmt., Security Service	
5. Initial cleaning before ramping-up operations is done	Plant Mgmt., Facilities, Health/Safety	
6. Rules for entrance of external people updated (if necessary)	Plant Mgmt., Security Service	
7. Ensure working distance according to local regulation (e.g. > 1.5 m in Germany)	Plant Mgmt., Leadership Team, Health/Safety	

Communication

Task	Function	Materials & good practices
1. Define how to inform shop floor staff about rules and regulations on their day of return	Plant Mgmt., HR, COMM	Examples: e-mail, video, info screens, info boards, Skype, meeting/speech
2. Inform all staff at home about start of ramp-up, reassuring them that health and safety are a top priority	Plant Mgmt., Medical, HR	Communication to associates without company device (intranet) Example: e-mail, personal phone calls by team leader with each team member, other established channels available to shift supervisors/teams
3. Continue to offer a channel for feedback, questions, and concerns from associates	Plant Mgmt., HR, COMM	Examples: mailbox for questions, local Covid-19 hotline
4. Define rules for stand-up meetings depending on current status	Plant Mgmt., Health/Safety, Leadership Team	
5. Inform authorities about ramp-up	Plant Mgmt.	
6. Inform external partners about ramp-up	Plant Mgmt., Logistics, Quality	

Value Stream Management

Task	Function	Materials & good practices
1. Regular short cycled contact to customers. Ask whether call-offs (EDI) are realistic. Ask for priority of parts in case critical ones. Create an overview on most critical customer demand.	Logistics	
2. If you experience sudden increase of customer demand in short-term, check delivery options. If you cannot confirm, contact customer and ask to postpone resp. bear for cost (e.g. special freight).	Logistics	
3. Prepare alternatives for production processes in good time in case suppliers should fail. Changes in production procedures due to distance and hygiene rules?	Manufacturing, Quality	
4. Announce freight quotas for ramp-up in good time to TMC (bottlenecks or blocked transportation routes to be expected). Inform TMC and Non-TMC about ramp-up plan.	Logistics	

<p>5. Rework CDD (confirmed delivery dates) and planned production orders in SAP. Set up levelling for production ramp-up. Define most important part numbers per value stream.</p>	<p>Logistics, Manufacturing</p>	
<p>6. Work organization to be adapted to hygiene rules and social distancing (temporal and spatial sectoring, shift extension, bottleneck processes). All tests still to be carried out.</p>	<p>Plant Mgmt., Leadership team, Health/Safety</p>	
<p>7. Increased training to be carried out due to expected higher sickness rate and changed work contents. Focus on check items of Layered Process Confirmation (LPC).</p>	<p>Plant Mgmt., Manufacturing</p>	
<p>8. Check expiry dates of relevant materials, auxiliary and operating materials before ramp-up (coolant, lubricants, wash media, adhesives). Start equipment which needs a start-up phase in good time.</p>	<p>Manufacturing, Logistics,</p>	
<p>9. Regular short cycled contact to critical suppliers, sub suppliers and “external workbenches”. Create an overview on supply capabilities.</p>	<p>Logistics</p>	
<p>10. Define procedure for forwarders, special transportations and parcel services (social distancing)</p>	<p>Logistics, Health/Safety</p>	
<p>11. Check timely limited concessions incl. risk assessment. Lean approval process e.g. by Quality team and value stream manager. Recommendation: harmonized approach in the business unit; avoid formalism. Identify and plan increased inspection needs (for batch releases, sampling inspections). Changes / change requests should not be carried out until safe ramp-up is managed</p>	<p>Quality, Manufacturing</p>	
<p>12. Initiate a ramp-up evaluation e.g. by LPC (prioritization to bottleneck stations, stations with high failure rate or new associates). Additional measures and extended sample size to be planned for ramp up. Poka Yoke systems working? Analyze failures promptly.</p>	<p>Plant Mgmt., Manufacturing, Quality</p>	
<p>13. Are machines sufficiently prepared for the ramp-up? Are maintenance intervals covered? Use downtimes for maintenance activities if possible. Take different ramp-up times into account. Prepare enhanced safety measures (e.g. fire brigade).</p>	<p>Manufacturing, Health/Safety</p>	
<p>14. Are measurement inspection and test equipment (MIT) calibration intervals covered? Are there critical/sensible MIT equipment / inspection processes? If yes, calibrate before ramp-up (first produced parts OK).</p>	<p>Quality</p>	
<p>15. Core teams for function of IT infrastructure (key users, emergency staffing). Clarify escalation for</p>	<p>IT</p>	

services. Contact in the plant to be defined and available.		
16. Check inventories of direct/indirect material, esp. packaging material (if applicable agree on alternative packaging)	Logistics	

PHASE 3: EARLY RAMP-UP (DAY 1-3)

Leadership Team

Task	Function	Materials & good practices
1. Teach associates for usage of personal protective equipment (e.g. masks, glasses)	Plant Mgmt., Leadership Team, Health/Safety	Hint: Destroy masks after usage to prevent selling of used masks in the market
2. Start day 1 with ramp-up team (service, technicians) to start critical processes	Plant Mgmt., Leadership Team	
3. Stepwise ramp-up (increase number of associates, shifts)	Plant Mgmt., Manufacturing, HR, Logistics	
4. Create dedicated plan for relevant line/product for the ramp up incl. responsibilities	Plant Mgmt., Manufacturing,	Example: order how the line has to be started (machine setter), tool check (machine setter), material, ...
5. Create communication rules to report status for further decisions	Plant Mgmt., Leadership Team, HR, COMM	Example: short stand-up meeting every 2 hrs.
6. Definition of ramp-up assurance plan for critical processes	Manufacturing, Quality	Examples: number of parts, profiling of temperature processes, electrical tests
7. Define/publish criteria for successful ramp-up	Plant Mgmt., Leadership Team	
8. Follow measures in case of infections	Plant Mgmt., Leadership Team, Medical	
9. In case of infections, record and report contact persons, send in quarantine	Plant Mgmt., Leadership Team, Medical	
10. Ensure that all Q-gates and start-up controls are done properly	Manufacturing, Quality	

Associates

Task	Function	Materials & good practices
1. Strictly follow hygiene regulations	All associates	
2. Strictly follow social distancing	All associates	

3. Strictly follow meeting policy	All associates	
4. Strictly follow advice for people with higher risk	All associates	
5. No shift overlap/separate break rooms	All associates	
6. No collective trainings	All associates	

Site environment control

Task	Function	Materials & good practices
1. Temperature checks at the gates if required by local regulations	Plant Mgmt., Security Service	
2. Allow no external visitors on site	Plant Mgmt., Security Service	
3. Entrance controls for associates, externals	Plant Mgmt., Security Service	
4. Ensure working distance according to local regulation (e.g. > 1.5m in Germany)	Plant Mgmt., Leadership Team, Health/Safety	
5. Frequent disinfection of handles, handrails, canteen Work place cleaning on a regular basis	Plant Mgmt., Facilities	

Communication

Task	Function	Materials & good practices
1. Plant Management/shift supervisors to inform associates in each shift about customer situation and prevention measures, supported by MED, Health/Safety and works council	Plant Mgmt., Medical, Health/Safety, HR, Manufacturing	
2. Stand-up meetings to again communicate hygiene rules and code of conduct	Plant Mgmt., Medical, Health/Safety, Leadership Team, COMM	
3. Appreciate personal efforts and contribution by all associates with continued communication	Plant Mgmt., COMM	
4. Ask leadership and indirect staff to inform themselves about latest corporate regulations regarding coronavirus via intranet	Plant Mgmt., Leadership Team, COMM	
5. Continue to offer a channel for feedback, questions, and concerns from associates	Plant Mgmt., HR, COMM	Examples: mailbox for questions, local Covid-19 hotline
6. Close collaboration with local authorities	Plant Mgmt.,	

Value Stream Management

Task	Function	Materials & good practices
1. Regular short cycled contact to customers. Ask whether call-offs (EDI) are realistic. Ask for priority of parts in case critical ones. Create an overview on most critical customer demand. Review delivery situation towards customers.	Logistics	
2. If you experience sudden increase of customer demand in short-term, check delivery options. If you cannot confirm, contact customer and ask to postpone resp. bear for cost (e.g. special freight).	Logistics	
3. Announce freight quotas in good time to TMC (bottlenecks or blocked transportation routes to be expected). Inform TMC and Non-TMC about ramp-up plan.	Logistics	
4. Rework CDD (confirmed delivery dates) and planned production orders in SAP. Check the production plan several times a day and adapt it, if necessary. Review most important part numbers per value stream. Start reporting, Daily coverage list.	Logistics, Manufacturing	
5. Work organization to be adapted to hygiene rules and social distancing (temporal and spatial sectoring, shift extension, bottleneck processes). All tests still to be carried out.	Plant Mgmt., Leadership team, Health/Safety	
6. Increased training to be carried out due to expected higher sickness rate and changed work contents. Focus on check items of Layered Process Confirmation (LPC).	Plant Mgmt., Manufacturing, Logistics	
7. Regular short cycled contact to critical suppliers, sub suppliers and "external workbenches". Create an overview on supply capabilities.	Logistics	
8. Check timely limited concessions incl. risk assessment. Lean approval process e.g. by quality team and value stream manager. Recommendation: harmonized approach in the business unit; avoid formalism. Identify and plan increased inspection needs (for batch releases, sampling inspections). Changes / change requests should not be carried out until safe ramp-up is managed	Quality, Manufacturing	
9. Initiate a ramp-up evaluation e.g. by LPC (prioritization to bottleneck stations, stations with high failure rate or new associates). Additional measures and extended sample size to be planned for ramp-up. Poka Yoke systems working? Analyze failures promptly.	Plant Mgmt., Manufacturing, Quality	
10. Are machines sufficiently prepared for the ramp-up? (e.g. setting parameters, process tolerances, test program version)	Manufacturing	

Prepare enhanced safety measures (e.g. fire brigade).		
11. Check inventories of indirect material, esp. packaging material (if applicable agree on alternative packaging).	Logistics	

Covid-19 Guideline ramp-up

PHASE 4: FURTHER RAMP-UP (DAY 4-10)

Leadership Team

Task	Function	Materials & good practices
1. Follow measures in case of infections	Plant Mgmt., Leadership Team, Medical	
2. In case of infections, record and report contact persons, send in quarantine	Plant Mgmt., Leadership Team, Medical	
3. Monitor customer/supplier situation	Plant Mgmt., Logistics, Quality	

Associates

Task	Function	Materials & good practices
1. Strictly follow hygiene regulations	All associates	
2. Strictly follow social distancing	All associates	
3. Strictly follow meeting policy	All associates	
4. Strictly follow advice for people with higher risk	All associates	
5. No shift overlap/separate break rooms	All associates	
6. No collective trainings	All associates	

Covid-19 Guideline ramp-up

Site environment control

Task	Function	Materials & good practices
1. Special treatment of all visitors (truck drivers, external service providers, others), including protective equipment	Plant Mgmt., Logistics, Security Service	
2. Temperature checks at the gates if required by local regulations	Plant Mgmt., Security Service	
3. Entrance controls for associates, externals	Plant Mgmt., Security Service	
4. Ensure working distance according to local regulation (e.g. > 1.5m in Germany)	Plant Mgmt., Leadership Team, Health/Safety	
5. Frequent disinfection of handles, handrails, canteen Work place cleaning on a regular basis	Plant Mgmt., FCM	

Communication

Task	Function	Materials & good practices
1. Inform associates in each shift about status of ramp-up and Corona situation in plant	Plant Mgmt., Leadership Team, HR, COMM	Examples: teleconference, information screens, message on bulletin boards
2. Ask leadership and indirect staff to inform themselves about latest corporate regulations regarding coronavirus via intranet	Plant Mgmt., Leadership Team, COMM	
3. Regularly communicate local success stories about ramp-up and fight against coronavirus via info screens, bulletin boards or stories in Bosch Connect, BZO, or in-house journals	COMM	
4. Continue to do mostly all meetings via Skype	Plant Mgmt., Leadership Team	
5. Stand-up meetings to again communicate hygiene rules and code of conduct	Plant Mgmt., Medical, Health/Safety, Leadership Team, COMM	
6. Continue to offer a channel for feedback, questions, and concerns from associates	Plant Mgmt., HR, COMM	Examples: mailbox for questions, local Covid-19 hotline

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Value Stream Management

Task	Function	Materials & good practices
1. Regular short cycled contact to customers. Ask whether call-offs (EDI) are realistic. Ask for priority of parts in case critical ones. Create an overview on most critical customer demand. Review delivery situation towards customers.	Logistics	
2. If you experience sudden increase of customer demand in short-term, check delivery options. If you cannot confirm, contact customer and ask to postpone resp. bear for cost (e.g. special freight).	Logistics	
3. Rework CDD (confirmed delivery dates) and planned production orders in SAP. Check the production plan several times a day and adapt it, if necessary. Review most important part numbers per value stream. Start reporting, Daily coverage list.	Logistics, Manufacturing	
4. Work organization to be adapted to hygiene rules and social distancing (temporal and spatial sectoring, shift extension, bottleneck processes). All tests still to be carried out.	Plant Mgmt., Leadership team, Health/Safety	
5. Increased training to be carried out due to expected higher sickness rate and changed work contents. Focus on check items of Layered Process Confirmation (LPC).	Plant Mgmt., Manufacturing, Logistics	
6. Regular short cycled contact to critical suppliers, sub suppliers and "external workbenches". Create an overview on supply capabilities.	Logistics	
7. Check inventories of indirect material, esp. packaging material (if applicable agree on alternative packaging).	Logistics	