



Revenue for chemical manufacturers

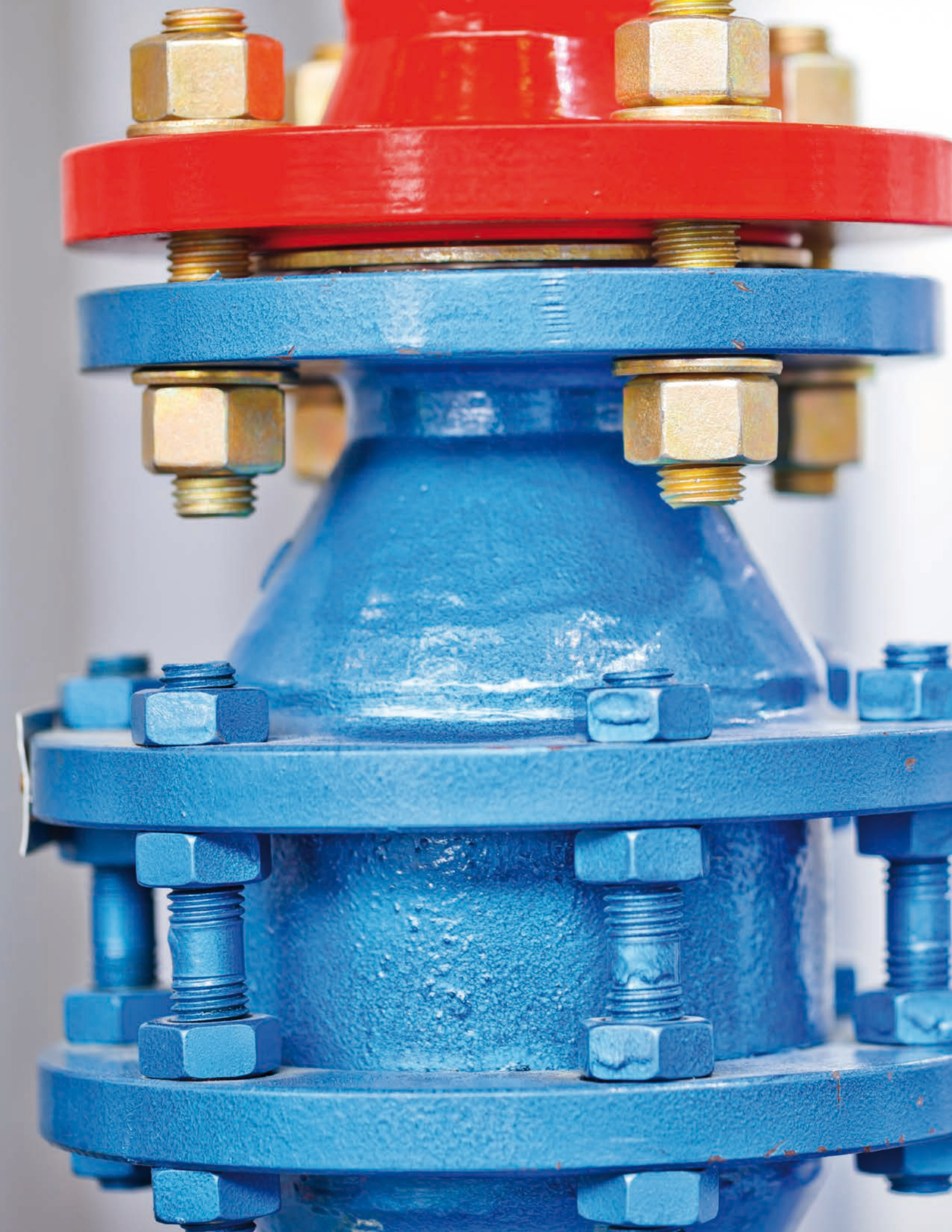
The new standard's
effective date
is coming.

US GAAP

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Revenue viewed through a new lens

Again and again, we are asked what's changed under the new standard: what do I need to tweak in my existing accounting policies for revenue? It's just not that simple.

The new standard introduces a core principle that requires companies to evaluate their transactions in a new way. It requires more judgment and estimation than today's accounting and provides new guidance to determine the units of account in a customer contract. The transfer of control of the goods or services to the customer drives the amount

and pattern of revenue recognition; this is a change from the existing risks and rewards model. As a result, there will be circumstances in which there will be a change in the amount and timing of revenue recognition.

Less has been said about disclosures, but the new standard requires extensive new disclosures.

Read this to understand *some* of the most significant issues for chemical manufacturers – the issues that you should be considering now.

What's inside

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Timing of revenue – over time



Chemical manufacturers that produce goods specifically for a customer based on the customer's design or formulation may see an acceleration in the timing of revenue and cost recognition.

Current US GAAP practice generally treats contract and other manufacturing arrangements as product sales. This results in revenue recognition at a point in time – when the manufactured goods are shipped or delivered to the customer – unless the bill-and-hold criteria are met.

No alternative use to the entity and enforceable right to payment

Under the new standard, a manufacturer that produces goods designed to a customer's unique specifications or formulation will need to carefully evaluate its contracts. This is because revenue is required to be recognized over time as manufacturing occurs if the customized product has no alternative use to the manufacturer, and the manufacturer has an enforceable right to payment for performance completed to date.

When evaluating whether the customized product has an alternative use, the manufacturer considers the goods that will ultimately be transferred to the customer. An enforceable right to payment exists if the manufacturer is entitled to payment of costs plus a reasonable margin on the work performed to date in the event the customer terminates the contract early for reasons other than the manufacturer's failure to perform as promised.

This analysis is performed on an individual contract basis for each performance obligation within a contract. Similar goods or services could have different patterns of recognition depending on the payment terms in each contract. Manufacturers need to establish internal controls, policies and procedures to identify contract terms (e.g. a right to payment on termination) that would result in over-time versus point-in-time revenue recognition.

Customer simultaneously receives and consumes benefits

The new standard also requires entities to recognize revenue over time if the customer simultaneously receives and consumes the benefits as the entity performs. An entity that agrees to deliver a chemical product considers the nature of its promise to determine whether to recognize revenue over time or at a point in time. In many contracts to deliver chemical product, an entity promises to transfer a good and will consider the point-in-time guidance to determine when control transfers. However, there may be scenarios in which an entity promises to provide a service of delivering a chemical product that the customer immediately consumes and therefore immediately receives the benefits.

For example, a contract to deliver a chemical product to temporary storage may represent a promise to deliver a good. However, a contract to provide a chemical product to the customer for on-demand consumption may represent a service that meets the criterion for over-time recognition and therefore may meet the criteria to be a series of distinct goods (see [Series of distinct goods](#)).

To determine whether the customer immediately consumes the assets and receives the benefits as the performance obligation is satisfied, the entity evaluates:

- the inherent characteristics of the chemical product;
- the contract terms;
- information about the infrastructure and other delivery mechanisms; and
- other relevant facts and circumstances.

The over-time criteria are listed in [Step 5: Recognize revenue](#). Only if none of the over-time criteria are met will the manufacturer recognize revenue at a point in time (see [Timing of revenue – point in time](#)).

Example

Chemical Manufacturer produces chemical compounds, but the production differs substantially on the basis of each customer's needs.

Manufacturer enters into a contract to produce a customized compound for Customer. Manufacturer uses standard raw materials to manufacture the customized compound. These raw materials are interchangeable with other products until actually deployed in the customer's customized compound.

The contract requires Customer to compensate Manufacturer for its cost incurred to date plus an 18 percent margin if Customer terminates the contract for reasons other than Manufacturer's failure to perform. Manufacturer does not have an enforceable right to payment based solely on the procurement of the standard raw materials. Only once the materials are incorporated into the customer's compound is there an enforceable right to payment.

At contract inception, Manufacturer assesses whether the compound, in its completed state, will have an alternative use to Manufacturer. Although the contract does not preclude Manufacturer from directing the completed compound to another customer, Manufacturer would incur significant costs to rework the compound to meet the needs of other customers. In this example, the customer-specific design of the compound restricts Manufacturer's practical ability to readily direct the compound to another customer. Therefore, the compound does not have an alternative use to Manufacturer.

Revenue for the contract with Customer will be recognized over time because the contract meets one of the over-time criteria – its performance does not create an asset with an alternative use *and* Manufacturer has an enforceable right to payment for performance completed to date. Materials that have not been integrated are inventory and therefore the inability to enforce payment for such costs is not relevant for the analysis.

When any of the over-time criteria are met, manufacturers need to determine a method for measuring progress during the manufacturing process. This method should depict performance in transferring control of goods and services to the customer.

We expect that many chemical manufacturers that meet the criteria may measure their progress using an input method, such as the cost-to-cost method. The FASB believes that output methods, such as units-of-production or units-of-delivery, do not depict performance if WIP or finished goods controlled by the customer are significant. Therefore, such output methods

need to be modified to reflect the transfer of control for WIP or finished goods.

Also, related costs that are currently accounted for as inventory will be expensed as incurred under the new standard when control transfers to the customer over time. Depending on when standard materials are integrated into products and have no alternative use to the manufacturer, the new standard may have a significant effect on both the income statements and balance sheets of manufacturers.

This change means that revenue and gross margin will be recognized earlier for some chemical manufacturers than under current US GAAP.

Example

Assume the same fact pattern as in the previous example, but with the following additional information.

- Customized compound contract price = \$1,000.
- Expected costs = \$850, resulting in expected margin of \$150, or 15%.
- Manufacturer uses the cost-to-cost method as the measure of progress to recognize revenue.

The financial statement effect shown below assumes that 50% of the estimated cost has been incurred as of the reporting date and that cost-to-cost is an appropriate measure of performance.

	Current US GAAP: Point-in-time	New standard: Over-time, cost-to-cost method
Revenue	\$0	\$500 = \$1,000 × 50%
COGS	\$0	\$425 = \$850 × 50% ¹
Gross margin	\$0	\$75
Contract asset/ accounts receivable	\$0	\$500 = \$1,000 × 50%
Inventory	\$425 = \$850 × 50%	\$0 ¹

Note:

1. All standard materials and WIP have been integrated into the product and have no alternative use.

In this example, the change to the over-time, cost-to-cost method from point-in-time revenue recognition has the effect of accelerating revenue, cost of goods sold and gross margin, and eliminating WIP and finished goods inventory.

Vertically integrated supply chain

It is common for a chemical manufacturer to have a vertically integrated supply chain that involves two or more manufacturing facilities – where one facility produces an intermediate chemical and ships to another facility to finalize the products. When customized products that meet the over-time criteria are produced in such a manufacturing chain, the manufacturer is required to measure the manufacturing progress from a consolidated perspective and not account for each intermediate chemical at the individual facility level.

For example, a contract requires the consolidated entity to make Chemical C, which is a blend of components A (90%) and B (10%). Subsidiary S1 makes component A and Subsidiary S2 makes component B. If Subsidiary S2 is 100%

complete with component B, the consolidated entity will need to analyze the percentage complete for Chemical C, not the percentage complete for component B. This may affect the amount and timing of revenue recognized for each facility's efforts because revenue is recognized based on the single performance obligation and measure of progress at the consolidated level.

If the cost-to-cost method is used to recognize revenue, the identification of all costs incurred to date and estimated costs to complete will be critical and could be a complex exercise for a manufacturing process that involves multiple manufacturing facilities, perhaps in multiple countries. Chemical manufacturers also need to consider how these changes may impact transfer pricing for tax purposes.

Timing of revenue – point in time



Certain types of arrangements will experience a change in the timing of revenue recognition based on when control transfers to the customer.

Under the new standard, if a performance obligation is not satisfied over time, then a manufacturer recognizes revenue at the point in time at which it transfers control of the good or service to the customer. Control refers to the ability to direct the use of, and obtain substantially all of the remaining benefits from, the good or service. The timing of revenue recognition could change in some circumstances as the focus shifts from the transfer of risks and rewards under current US GAAP to the transfer of control under the new standard.

The notion of risks and rewards is only one of the indicators of control. Other indicators such as legal title, physical possession, right to payment and customer acceptance also need to be evaluated for each arrangement. Depending on the facts and circumstances, revenue satisfied at a point in time could be recognized at a point different from current US GAAP.

For example, consider shipping arrangements with contractual FOB shipping point delivery terms but the manufacturer

promises (either explicitly, or implicitly based on its past practice) that all goods lost or damaged in transit will be replaced. This is often referred to as 'synthetic FOB destination'.

Under current guidance, revenue recognition is generally precluded until the product is delivered to the customer's destination. This is because the risks and rewards of ownership have not transferred to the customer, despite having satisfied the FOB shipping point delivery terms.

Under the new standard, whether the significant risks and rewards have been transferred is only one indicator of the transfer of control. A manufacturer needs to evaluate all indicators and as a result could reach a different conclusion about the timing of revenue recognition – i.e. that control transfers at FOB shipping point.

Bill-and-hold arrangements



An explicit customer request and a specified delivery schedule are no longer required to recognize revenue under a bill-and-hold arrangement.

Under current SEC guidance on bill-and-hold arrangements, revenue is not recognized until all bill-and-hold criteria are met. The new standard focuses on when control of the good transfers to the customer.

The criteria for bill-and-hold arrangements under the new standard differ in two key respects from current SEC guidance.

- The bill-and-hold arrangement is not required to be at the customer's explicit request. The new standard requires the reason for the bill-and-hold arrangement to be substantive. An understanding of the business reasons is important.
- The entity does not need a specified delivery schedule to meet the bill-and-hold criteria. However, the lack of a planned or estimated delivery date could indicate that the contract does not exist because the enforceable rights and obligations between the parties are not clear (see [Step 1:](#)

[Identify the contract](#)). If a delivery schedule does not exist, it may be important that the entity receives appropriate consideration to hold the asset indefinitely to conclude that the parties are committed to their obligations and that a contract exists.

Under the new standard, an obligation to store the goods after control has transferred to the customer may be a separate performance obligation and if so, revenue is allocated and recognized as the storage service is provided.

It is important for chemical manufacturers to evaluate the over-time recognition criteria first. This is because some arrangements that are accounted for as bill-and-hold arrangements under current US GAAP may be accounted for as over-time performance obligations under the new standard. In those cases, the bill-and-hold guidance does not apply.

Shipping and handling

Accounting for shipping depends on an entity's policy election.

The accounting for shipping and handling under the new standard depends on whether these activities are performed before or after the customer obtains control of the goods.

- If the shipping and handling occur *before* the customer obtains control of the goods, they are fulfillment activities.
- If the shipping and handling occur *after* a customer obtains control of the goods, an entity makes a policy election to treat these costs as:
 - fulfillment activities, in which case the entity accrues the costs of these activities and recognizes revenue for the full amount of the goods and shipping and handling when control of the goods transfers to the customer; or

- a performance obligation, in which case the entity allocates a portion of the transaction price to the shipping and handling. Revenue allocated to the goods is recognized *when* control of the goods transfers to the customer; revenue allocated to the shipping and handling is recognized *as* the shipping and handling performance obligation is satisfied. The related costs are generally expensed as incurred.

Regardless of the policy elected, when an entity concludes that control transfers to the customer before the risks and rewards of ownership have transferred, it may experience a change in practice if it currently applies synthetic FOB destination accounting.

Series of distinct goods



Chemical manufacturers in the scope of the series guidance may see an acceleration in the timing of revenue, cost and margin recognition.

Under the new standard, if a series of goods promised in a manufacturing contract are distinct, substantially the same, meet the over-time criteria (see [Timing of revenue – over time](#)) and have the same pattern of transfer, those goods are in the scope of the series guidance; application of the series guidance is not optional. This means that they are a single performance obligation – i.e. a single unit of account. For example, if the series guidance applies, a contract to provide 1,000 units of a product is considered a single performance obligation to provide those units, rather than multiple performance obligations to deliver each of the units.

Current US GAAP doesn't have a concept similar to the series guidance.

If the series guidance applies (i.e. a single performance obligation) and revenue is recognized over time using the cost-to-cost method, revenue and gross margin may be recognized earlier when there are learning curve costs involved in the production process compared with the current units-based method.

Example

Chemical Manufacturer enters into a contract with Customer to produce 100,000 gallons of a customized blend of chemicals for use by Customer in its products. Deliveries are expected to occur over an 18-month period. Manufacturer concludes that the product will transfer to Customer over time because:

- it has no alternative use to Manufacturer; and
- Customer is contractually obligated to pay Manufacturer for any finished or in-process product, including a reasonable margin, if Customer terminates the contract for reasons other than Manufacturer's failure to perform.

Manufacturer uses a cost-to-cost measure of progress for each product.

Manufacturer concludes that each of the 100,000 gallons is distinct. This is because:

- Customer can use each gallon of the chemical blend on its own; and
- each gallon is separately identifiable from the others because one does not significantly affect, modify or customize another.

Despite the fact that each gallon is distinct, Manufacturer concludes that the 100,000 gallons are a single performance obligation because:

- the chemicals will transfer to Customer over time; and
- Manufacturer uses the same method (cost-to-cost) to measure progress toward complete satisfaction of the obligation to transfer each gallon of the chemical blend to Customer.

Consequently, the transaction price for all 100,000 gallons is recognized over time using an appropriate measure of progress. This outcome may be different from the outcome of allocating a fixed amount of revenue to each gallon if each one were a performance obligation on its own rather than a single performance obligation.

Volume rebates and discounts



Most retrospective volume rebates will have similar accounting to today. However, revenue may be deferred for certain discounts on future purchases.

Chemical manufacturers may provide incentives to their customers through volume rebates or discounts. These incentives can take different forms. For example, some agreements provide a discount or rebate that applies to all purchases made under the agreement – i.e. the discount or rebate applies on a retrospective basis once a volume threshold is met. In other cases, the discounted purchase price may only apply to future purchases once a minimum volume threshold has been met. These different structures of discounts and rebates may result in different accounting under the new standard.

Retrospective rebates or discounts

If a rebate or discount applies retrospectively to all purchases under the contract once the threshold is achieved, the rebate or discount usually represents variable consideration when an enforceable contract exists. In that case, the entity:

- estimates the volume to be purchased and the resulting discount in determining the transaction price from inception of the contract; and
- updates that estimate throughout the term of the contract, recognizing revenue based on the estimated transaction price when control of the underlying goods and services in the contract transfers to the customer.

An entity includes variable consideration in the transaction price to the extent it is probable that a significant reversal of cumulative revenue will not occur when the volume uncertainty is resolved (constraint on variable consideration).

This constraint on variable consideration may cause the accounting under the new standard to be different from current US GAAP in certain circumstances. For example, under current US GAAP, the maximum discount available is used as the estimated discount if the entity is unable to make a reasonable estimate. The new standard does not default to the maximum discount, but instead requires an entity to evaluate the probability and significance of a reversal of revenue.

Future discounts

A manufacturer may grant the customer an option to acquire additional goods or services at a discount. That option is a performance obligation under the contract if it provides a material right that the customer would not receive without entering into that contract. Therefore, if a tiered pricing structure provides for discounts on optional future purchases, the manufacturer evaluates the arrangement to determine if it conveys a material right to the customer.

A material right exists if:

- the discount provides the customer with an option to purchase additional goods or services at a price that does not reflect their stand-alone selling prices; and
- those discounts are only earned as a result of the customer entering into the arrangement.

If a material right exists, it is accounted for as a separate performance obligation; this results in revenue being allocated to the option and deferred until the option is exercised or expires.

The allocated amount of revenue deferred is based on the relative stand-alone selling price of the customer's option to acquire additional goods or services. If that price is not directly observable, the manufacturer will need to estimate it. This estimate reflects the discount that the customer would obtain when exercising the option, adjusted for:

- any discount that the customer would receive without exercising the option; and
- the likelihood that the option will be exercised.

If the goods or services that the customer has a material right to acquire are:

- similar to the original goods or services in the contract; and
- are provided in accordance with the terms of the original contract,

then a manufacturer, as a practical alternative to estimating the stand-alone selling price of the option, may allocate the transaction price to the optional goods or services by reference to the goods or services expected to be provided and the corresponding expected consideration.

Example

Chemical Manufacturer enters into a contract with Customer to manufacture and deliver a minimum of 100 metric tons of a chemical product during the next three years. The contract includes an option for Customer to purchase additional quantities of the same product once Customer has purchased 100 metric tons.

The contract calls for a per-unit price of \$1,000 for the first 100 metric tons delivered, and a per-unit price of \$800 thereafter (i.e. a 20% discount). Manufacturer's standard selling price for this chemical is \$1,000 per metric ton.

Manufacturer concludes that the discount for quantities sold after the initial 100 metric tons provides a material right that Customer would not receive without entering into the original sales contract. Therefore, the discount is a separate performance obligation.

Manufacturer estimates that Customer will most likely purchase 200 metric tons during the life of the contract.

Manufacturer estimates the price of the option, using the 'practical alternative', as:

- expected transaction price of \$180,000 = (\$1,000 per-unit price × first 100 sold) + (\$800 per-unit price × 100 anticipated incremental sales in excess of 100 minimum); and
- per-metric ton transaction price of \$900 = \$180,000 / 200 metric tons anticipated to be sold.

During the three-year contract period, Customer:

- initially purchases 100 metric tons; and
- subsequently purchases another 50 metric tons.

Although Customer does not make any additional purchases (to reach the total expected 200 metric tons), Manufacturer does not record any breakage for the unused discount before expiration of the discount option.

Manufacturer records the following journal entries.	Debit	Credit
Cash	\$100,000	
Revenue		\$90,000
Contract liability		\$10,000
<i>To record initial sale of 100 metric tons minimum purchase order and discount performance obligation.</i>		
Cash	\$40,000 ¹	
Contract liability	\$5,000 ²	
Revenue		\$45,000
<i>To record subsequent 50 metric tons (i.e. in excess of 100).</i>		
Contract liability	\$5,000 ³	
Revenue		\$5,000
<i>To record expiration of discount performance obligation.</i>		
Notes: 1. Discounted sale price for additional products purchased: 50 metric tons × \$800. 2. Partial satisfaction of performance obligation: \$10,000 × (50 incremental metric tons / 100 incremental metric tons purchase expected). 3. Remaining (unused) discount performance obligation when option expires: \$10,000 - \$5,000.		

A material right may not exist if the discount provided to the customer is similar to that provided to other customers in the same class regardless of whether they had qualifying prior purchases.

For example, in the above example assume that Customer receives the discount based on its volume purchases in the prior year, but Manufacturer provides that same discount to new customers of a similar size that were not required to

make purchases. The fact that Manufacturer does not require customers in a similar class to earn the discount indicates that the discounted pricing may not represent a material right. If a material right does not exist, there is no accounting for the future option. The transactions completed before the volume threshold is met are recognized at the contract price (i.e. \$1,000 per metric ton in the example), and purchases after the threshold has been met are accounted for at the discounted price (i.e. \$800 per metric ton in the example).

Pricing changes

Price changes are accounted for differently depending on their nature and a manufacturer's pricing practices.

Price protection clauses

Manufacturers may offer customers price protection by means of a rebate, credit or future price concession if the manufacturer reduces the product price for other customers.

- Retrospective price protection clauses change the price paid for goods or services already transferred (e.g. products already delivered) or partially transferred to the customer. Therefore, they are a potential price concession – i.e. variable consideration, as discussed in [Step 3: Determine the transaction price](#).
- Most-favored nations clauses apply prospectively to distinct promised goods or services (including distinct goods or services within a single performance obligation that is a series), or optional goods or services not yet transferred to the customer. Such clauses do not create variable consideration. Rather, when the transaction price changes, the entity accounts for the price changes as a contract modification, as discussed in [Contract modification](#).

Price escalation clauses

Contracts with customers often contain price escalation clauses. These clauses may be based on predetermined prices, an index or other measurable market circumstances. Manufacturers must analyze price escalations to determine whether future prices stated in the contract are commensurate with the *stand-alone selling price*, including an evaluation of future pricing in similar contracts entered into at or near the contract inception.

- If the committed future price *is commensurate* with the stand-alone selling price of the good for the given period, the manufacturer recognizes revenue based on the stated contract pricing.
- If the committed future price is *less* than the stand-alone selling price of the good for the given period and the customer

is obligated to purchase a specified quantity, the manufacturer evaluates the contract for variable consideration (see [Step 3: Determine the transaction price](#)).

- If the committed future price is *less* than the stand-alone selling price of the good for the given period and the customer is *not obligated* to purchase a specified quantity (i.e. a contract does not exist), the manufacturer evaluates whether the customer is provided with a material right (i.e. a separate performance obligation to deliver discounted product in the future at the customer's option). If a material right exists, a component of the transaction price from the initial contract is deferred and recognized as revenue when the option is exercised or expires (see [Volume rebates and discounts](#)).
- If the committed future price is *more* than the stand-alone selling price of the good for the given period and the customer is *not obligated* to purchase a specified quantity (i.e. a contract does not exist), the manufacturer has made an offer to sell goods and recognizes revenue based on the offered contract pricing. However, such arrangements would be unusual and may be an indicator of additional goods or services provided or other circumstances that require separate evaluation and consideration.

Other price changes

A manufacturer's transaction price may be affected by awards, incentive payments and claims; all of these may be contingent on the occurrence or nonoccurrence of future events or activities (e.g. delivering the products on time). These other effects will usually result in variable consideration, as opposed to being identified and accounted for as separate performance obligations, and are estimated (subject to the constraint on variable consideration) and included in the transaction price (see [Step 3: Determine the transaction price](#)).

Take-or-pay arrangements

Take-or-pay arrangements may require chemical manufacturers to account for MSAs as one contract.

Manufacturers often enter into take-or-pay arrangements with customers. These arrangements require the customer to pay for the minimum specified goods even if it does not take possession of them. In these situations, a framework agreement – such as a master supply agreement (MSA) – that contains the take-or-pay arrangement might meet the definition of a contract under the new standard.

Therefore, the arrangement will need to be evaluated to determine whether a contract exists (see [Step 1: Identify the contract](#)).

Under the new standard, it is important to appropriately evaluate the entity's underlying promise to determine how

the variability created by a take-or-pay contract should be accounted for.

For example, the manufacturer's underlying promise could be:

- an obligation to provide a specified quantity of goods or services; or
- a series of distinct goods or services if they meet the criteria for a series (see [Series of distinct goods](#)).

Additional quantities beyond the minimum in a take-or-pay arrangement could also represent customer options for which the entity will need to consider whether a material right exists (see [Customer options](#)).

Example

Chemical Manufacturer enters into a contract to supply Customer with industrial gas for the next three years. The contract requires Customer to either take or pay for contractual minimums each year.

	Year 1	Year 2	Year 3
Minimum units	1,000	1,200	1,500
Price per unit	\$1.10	\$1.05	\$1.00
Annual fixed consideration	\$1,100	\$1,260	\$1,500
Estimated sales (units)	1,000	1,200	1,500
Total expected consideration	\$1,100 ¹	\$1,260 ²	\$1,500 ³

Notes:

1. 1,000 units × \$1.10 = \$1,100.
2. 1,200 units × \$1.05 = \$1,260.
3. 1,500 units × \$1.00 = \$1,500.

Manufacturer:

- determines that each unit is a performance obligation because each unit is distinct and does not meet any of the criteria to be recognized over time (i.e. is not a series); and
- estimates the stand-alone selling price for the industrial gas at \$1.10 per unit throughout the contract period.

Based on the total expected consideration of \$3,860 (\$1,100 + \$1,260 + \$1,500) for 3,700 units (1,000 + 1,200 + 1,500), the revenue per unit is \$1.043 (\$3,860 / 3,700). Therefore, Manufacturer recognizes \$1.043 per unit when control is transferred to Customer.

Sales above the minimum quantities are considered optional purchases because they provide Customer the right to purchase additional quantities. In addition, because the sales price for optional future purchases in Years 2 and 3 is less than the sales price in Year 1, Manufacturer will need to consider whether the Years 2 and 3 pricing provides Customer with a material right for any additional purchases. This example assumes no material right is being provided based on estimated stand-alone selling prices to similarly situated customers in Years 2 and 3.

At the end of each reporting period, Manufacturer will update its estimate of unit sales and expected consideration for the contract.

During Year 1

Unit sales are 1,000 (i.e. actual is the same as the estimate), and Manufacturer recognizes \$1,043 of revenue based on actual sales of 1,000 units ($1,000 \times \$1.043$ per unit).

At the end of Year 1

Manufacturer estimates that future unit sales and expected consideration are the same as at contract inception and therefore does not adjust the revenue recognized for Year 1.

During Year 2

Unit sales are 1,200 (i.e. actual is the same as the estimate), and Manufacturer recognizes \$1,252 of revenue based on actual sales of 1,200 units ($1,200 \times \$1.043$ per unit).

At the end of Year 2

Manufacturer updates its estimate of unit sales and expected consideration for the contract. Manufacturer believes that Customer will only be able to take 1,400 units in Year 3 (i.e. will pay without taking control of the industrial gas).

	Year 1	Year 2	Year 3
Minimum units	1,000	1,200	1,500
Price per unit	\$1.10	\$1.05	\$1.00
Annual fixed consideration	\$1,100	\$1,260	\$1,500
Actual/estimated sales (units)	1,000 (actual)	1,200 (actual)	1,400 (estimated)
Total expected consideration	\$1,100 ¹	\$1,260 ²	\$1,500 ³

Notes:

1. $1,000 \text{ units} \times \$1.10 = \$1,100$.
2. $1,200 \text{ units} \times \$1.05 = \$1,260$.
3. Minimum purchase of 1,500 units $\times \$1.00 = \$1,500$.

Based on the total expected consideration of \$3,860 ($\$1,100 + \$1,260 + \$1,500$) for 3,600 units ($1,000 + 1,200 + 1,400$), the revenue per unit is approximately \$1.072 ($\$3,860 / 3,600$). Therefore, Manufacturer adjusts revenue and recognizes \$1,315 of revenue in Year 2: ($2,200 \text{ units delivered in Years 1 and 2} \times \1.072 , or \$2,358) - \$1,043 revenue recognized in Year 1.

This example accounts for the change in units as an adjustment to cumulative revenue under the contract. In some cases, the change in units may also be attributed to the respective annual revenue.

This example excludes any effect of significant financing. However, Manufacturer would consider whether a significant financing component exists based on the difference between performance and payment as a result of the blended rate. See [Significant financing component](#).

Alternative view: An entity could view a customer's subsequent decision to not take the minimum quantity as a contract modification because it represents a change in scope (i.e. a reduction to the enforceable minimum quantity). This view results in accounting similar to a partial termination of a contract. Because the remaining units are distinct from the units previously transferred, revenue is adjusted prospectively instead of on a cumulative catch-up basis. See [Contract modification](#).

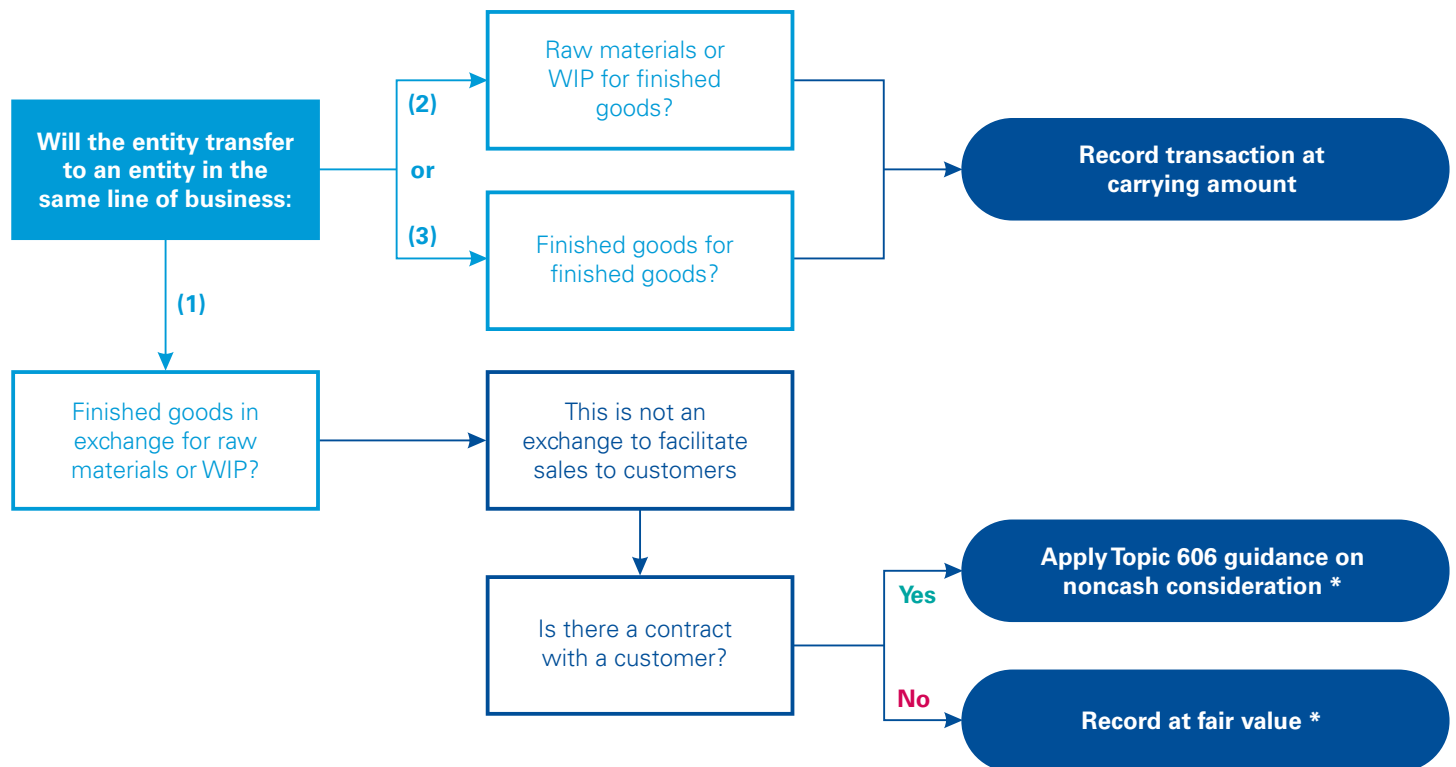
Swaps and exchanges

A swap or exchange may need to be accounted for under the new revenue standard.

Chemical manufacturers often enter into arrangements with other chemical manufacturers to either swap or exchange inventory to facilitate sales to customers. While some exchanges are for the same product, others are for different products. Under both current US GAAP and the new standard, nonmonetary exchanges between entities in the same line of business to facilitate sales to customers are accounted for as nonmonetary transactions. However, if a transaction does not meet the scope of the guidance for nonmonetary exchanges between entities in the same line of business to

facilitate sales to customers, the manufacturer determines whether the transaction meets the definition of a contract with a customer, and therefore should be accounted for as noncash consideration under the new standard.

If the manufacturer enters into a nonmonetary exchange (i.e. an exchange involving less than 25% of the fair value in cash) with an entity in the same line of business, the manufacturer needs to consider what type of goods will be transferred to determine the relevant accounting model.



* Transactions in which the nonmonetary exchange of inventory between entities in the same line of business that is *not* to facilitate sales to customers will generally be based on fair value of the goods received regardless of whether the entity has a contract with a customer. However, if the entity determines there is a contract with a customer, then any variable amounts that are not the result of the form of the consideration are subject to the variable consideration constraint.

If the new standard applies to the transaction, the noncash consideration is reflected in the transaction price at its fair value measured at contract inception unless the noncash consideration is to facilitate an entity's fulfillment of the contract. In this case, it is measured when the entity obtains control of those contributed goods or services. If an entity cannot make a reasonable estimate of fair value, then it refers to the estimated selling price of the promised goods or services.

The fair value of noncash consideration can change after contract inception. In that case, the entity determines whether the change in fair value is due to the form of the consideration. The transaction price is not adjusted when variability is due to the form of consideration and any changes in fair value after contract inception are reported outside of revenue from customers. However, variability that is not caused by the form of consideration is subject to the guidance on constraining variable consideration and any change is reported in revenue.

Significant financing component



The amount of revenue recognized for long-term contracts may be affected by a significant financing component.

Manufacturers with long-term contracts need to evaluate whether the contracts include a significant financing component. If the period between performance and payment for that performance (whether in advance or in arrears) is one year or more, significant financing may exist between the parties. The financing component may be explicitly identified in the contract or may be implied by the contractual payment terms.

A contract does not have a significant financing component if the difference between the amount of promised consideration and the cash selling price of the promised goods or services arises for reasons other than the provision of financing.

For example, a customer may withhold an amount of consideration that is payable upon successful completion of the contract or the achievement of a specified milestone. The primary purpose of these payments may be to provide the customer with assurance that the entity will perform its obligation under the contract, rather than provide financing to the customer.

Manufacturers are required to adjust the promised amount of consideration for the time value of money when a contract contains a significant financing component. For advance payments in particular, the requirement to account for a significant financing component under the new standard is a change from current practice.

Advance payments

Under current US GAAP, advance payments from customers that do not require repayment in the future (i.e. deferred revenue), but are instead applied to the purchase price of

the goods or services, are excluded from the requirement to impute interest.

The requirements under the new standard are a change from current practice and may particularly affect long-term contracts in which payment is received significantly earlier than the transfer of control of goods or services to the customer.

When the financing component is significant to a contract, an entity increases the contract liability and recognizes interest expense for customer payments received before the delivery of the good or service. When it satisfies its performance obligation, the entity recognizes more revenue than the cash received from the customer; this is because the contract liability has been increased by the interest expense that is accreted. This accounting will result in an increase in revenue and an increase in interest expense compared with current US GAAP.

Payments in arrears

Under current US GAAP, payments in arrears (i.e. extended payment terms) may result in a conclusion that revenue is not fixed or determinable, which precludes revenue recognition. In those cases, entities default to a due-and-payable revenue model and do not account for a financing element.

Under the new standard, the transaction price is estimated and a separate evaluation is performed to determine whether the payment terms provide financing to the customer as long as collectibility of the contract price is probable. As a result, the accounting for financing in arrangements where the customer pays in arrears will likely arise more frequently than under current practice. Doing so will result in a decrease in revenue and an increase in interest income.

Contract modification



The previous revenue recognition guidance did not include a general framework for accounting for contract modifications – that has now changed.

MSA vs. purchase order

Chemical manufacturers often enter into framework arrangements like master supply agreements (MSAs) with customers, and subsequently receive purchase orders from customers on a periodic basis.

An MSA might not meet the definition of a contract in the new standard; this is because the MSA itself might not obligate the customer to purchase a minimum or specified quantity of products from the manufacturer or have a substantive penalty for terminating the MSA. In these cases, until the manufacturer receives a purchase order with a fixed commitment for a quantity of products, a contract does not exist.

In these situations, the purchase order in combination with the MSA needs to be evaluated to determine whether the Step 1 criteria are met and a contract exists. See [Step 1: Identify the contract](#) and [Take-or-pay arrangements](#).

Contract modification

Change orders are a common form of contract modification for manufacturers. There is currently guidance in US GAAP on contract modifications for long-term construction- and production-type contracts. However, current revenue recognition guidance does not include a general framework for accounting for contract modifications, and there is

diversity in practice for arrangements outside the scope of this guidance.

Under the new standard, all modifications are accounted for when they are approved using the same contract modification guidance. A contract modification is accounted for on a cumulative catch-up basis or prospectively depending upon the type of modification to the contract.

- If the contract modification **does not promise additional distinct goods or services**, the modification is generally accounted for on a cumulative catch-up basis.
- If the contract modification **adds additional distinct goods or services to the arrangement**, the modification is generally accounted for prospectively, with a reallocation of remaining revenue under the original contract if the additional goods or services are not priced at their stand-alone selling prices (e.g. blend-and-extend contracts whereby discounts are provided to extend the contract).
- If a contract includes a **single performance obligation that is a series**, the modification guidance is applied to the distinct goods or services within the series even though they are accounted for as one performance obligation. This generally results in prospective accounting for modifications and therefore, use of a cumulative catch-up model is not expected to be common for chemical manufacturers.

Applicable to all industries

Expanded disclosures

The new standard contains both qualitative and quantitative disclosure requirements for annual and interim periods. The objective of the disclosures is to provide sufficient information to enable users of the financial statements to understand the nature, amount, timing and uncertainty of revenue and cash flows arising from contracts with customers.

Specifically, the new standard includes disclosure requirements for:

- disaggregation of revenue;
- contract balances, including changes during the period;
- performance obligations;
- significant judgments; and
- assets recognized to obtain or fulfill a contract, including changes during the period.

An entity should review these new disclosure requirements to evaluate whether data necessary to comply with the disclosure requirements are currently being captured and whether system modifications are needed to accumulate the data.

Internal controls necessary to ensure the completeness and accuracy of the new disclosures should be considered – especially if the required data was not previously collected, or was collected for purposes other than financial reporting.

Also, SEC guidance requires registrants to disclose the potential effects that recently issued accounting standards will have on their financial statements when adopted¹. The SEC expects the level and specificity of these transition disclosures to increase as registrants progress in their implementation plans. The SEC has also stated, when the effect is not known or reasonably estimated, that a registrant should describe its progress in implementing the new standard and the significant implementation matters that it still needs to address.

Transition

An entity can elect to adopt the new standard in a variety of ways, including retrospectively with or without optional practical expedients, or from the beginning of the year of initial application with no restatement of comparative periods (cumulative effect method).

Entities that elect the cumulative effect method are required to disclose the changes between the reported results of the new standard and those that would have been reported under current US GAAP in the period of adoption.

For transition purposes, the new standard introduces a new term – completed contract. A completed contract is a contract for which an entity has recognized all or substantially all of the revenue under current US GAAP as of the date of adoption of the new standard. The concept of a completed contract is used when applying:

- certain practical expedients available during transition under the retrospective method; and
- the cumulative effect method coupled with the election to initially apply the guidance only to those contracts that are not complete.

This will require careful analysis particularly where there is trailing revenue after delivery has occurred (e.g. revenue was not fixed or determinable, collectibility was not reasonably assured, royalty arrangements). In those circumstances, the contract would not be considered complete if substantially all of the revenue had not been recognized before adoption. Applying the standard to these types of contracts at transition may result in revenue being pulled into the opening retained earnings adjustment.

Entities should consider the potential complexities involved with calculating the opening retained earnings adjustment and the recast of comparative periods (if any) when planning their implementation. It may be prudent for entities to perform transition calculations before the adoption date to ensure all potential complexities are identified.

Effective dates

Type of entity	Annual reporting periods after
Public business entities and not-for-profit entities that are conduit bond obligors	December 15, 2017 including interim reporting periods within that reporting period. Early adoption permitted for annual reporting periods beginning after December 15, 2016, including interim reporting periods within that reporting period.
All other US GAAP entities, including SEC registrants that are Emerging Growth Companies	December 15, 2018 and interim reporting periods within annual reporting periods beginning after December 15, 2019. Early adoption permitted for annual reporting periods beginning after December 15, 2016, including interim reporting periods within that reporting period or interim reporting periods within the annual period subsequent to the initial application.

1. Staff Accounting Bulletin Topic 11.M.

Some basic reminders

Scope

The guidance applies to all contracts with customers unless the customer contract is specifically within the scope of other guidance – e.g. Topic 944 (insurance), Topic 460 (guarantees).

The new standard applies to contracts to deliver goods or services to a customer. A 'customer' is a party that has contracted with an entity to obtain goods or services that are an output of the entity's ordinary activities in exchange for consideration.

The new standard will be applied to part of a contract when only some elements are in the scope of other guidance.



Step 1: Identify the contract

Contracts can be written, oral or implied by an entity's customary business practices, but must be enforceable by law. This may require legal analysis on a jurisdictional level to determine when a contract exists and the terms of that contract's enforceability.

A contract with a customer is in the scope of the new standard when the contract is legally enforceable and all of the following criteria are met:

- the contract has commercial substance;
- rights to goods or services can be identified;
- payment terms can be identified;
- the consideration the entity expects to be entitled to is probable of collection; and
- the contract is approved and the parties are committed to their obligations.

If the criteria are not met, any consideration received from the customer is generally recognized as a deposit (liability).



Step 2: Identify the performance obligations

Performance obligations do not have to be legally enforceable; they exist if the customer has a reasonable expectation that the good or service will be provided. A promise can be implied by customary business practices, policies or statements.

Performance obligations are the unit of account under the new standard and generally represent the distinct goods or services that are promised to the customer.

Promises to the customer are separated into performance obligations, and are accounted for separately if they are both (1) capable of being distinct and (2) distinct in the context of the contract.

An exception exists if the performance obligations represent a series of distinct goods or services that are substantially the same and that have the same pattern of transfer to the customer over time. A series is accounted for as a single performance obligation.



Step 3: Determine the transaction price

Estimating variable consideration will represent a significant departure from current accounting for many entities.

When determining the transaction price, an entity uses the legally enforceable contract term. It does not take into consideration the possibility of a contract being cancelled, renewed or modified.

The transaction price is the amount of consideration to which an entity expects to be entitled in exchange for transferring goods or services to a customer, excluding amounts collected on behalf of third parties – e.g. some sales taxes. This consideration can include fixed and variable amounts, and is determined at inception of the contract and updated each reporting period for any changes in circumstances.

The transaction price determination also considers:

- **Variable consideration**, which is estimated at contract inception and is updated at each reporting date for any changes in circumstances. The amount of estimated variable consideration included in the transaction price is constrained to the amount for which it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty is resolved.
- **Noncash consideration** received from a customer is measured at fair value at contract inception.
- **Consideration payable to a customer** represents a reduction of the transaction price unless it is a payment for distinct goods or services it receives from the customer.
- **Significant financing components** may exist in a contract when payment is received significantly before or after the transfer of goods or services. This could result in an adjustment to the transaction price to impute interest income/expense.



Step 4: Allocate the transaction price

A contractually stated price or list price is not presumed to be the stand-alone selling price of that good or service.

The transaction price is allocated at contract inception to each performance obligation to depict the amount of consideration to which an entity expects to be entitled in exchange for transferring the promised goods or services to the customer.

An entity generally allocates the transaction price to each performance obligation in proportion to its stand-alone selling price. However, when specified criteria are met, a discount or variable consideration is allocated to one or more, but not all, performance obligations.

The stand-alone selling price is the price at which an entity would sell a promised good or service separately to a customer. Observable stand-alone prices are used when they are available. If not available, an entity is required to estimate the price using other techniques – even if the entity never sells the performance obligation separately.



Step 5: Recognize revenue

An entity must first determine whether a performance obligation meets the criteria to recognize revenue over time.

If none of the over-time criteria are met, revenue for the performance obligation is recognized at the point in time that the customer obtains control of the goods or services.

Control is the ability to direct the use of, and obtain substantially all of the remaining benefits from the goods or services – or prevent others from doing so.

An entity recognizes revenue when it satisfies its obligation by transferring control of the good or service to the customer.

A performance obligation is satisfied **over time** if one of the following criteria are met:

- the customer simultaneously receives and consumes the benefits as the entity performs;
- the entity's performance creates or enhances an asset that the customer controls as the asset is created or enhanced; or
- the entity's performance does not create an asset with an alternative use to the entity, and the entity has an enforceable right to payment for performance completed to date.

If control transfers **over time**, an entity selects a method to measure progress that is consistent with the objective of depicting its performance.

If control transfers at a **point in time**, the following are some indicators that an entity considers to determine when control has passed. The customer has:

- a present obligation to pay;
- physical possession;
- legal title;
- risks and rewards or ownership; and
- accepted the asset.

Customer options

Customer options may be accounted for as performance obligations, resulting in more revenue deferral than under current GAAP.

Revenue is allocated to a customer option to acquire additional goods or services, and is deferred until (1) those future goods or services are transferred or (2) the option expires when it represents a material right. A material right exists if the customer is only able to obtain the option by entering into the sale agreement and the option provides the customer with the ability to obtain the additional goods or services at a price below stand-alone selling prices.

Warranties

Warranties do not have to be separately priced to be accounted for as performance obligations.

Assurance-type warranties will generally continue to be accounted for under existing guidance – i.e. Topic 450 (contingencies). However, a warranty is accounted for as a performance obligation if it includes a service beyond assuring that the good complies with agreed-upon specifications. This could require some warranties to be separated between a service element (deferral of revenue which is then recognized as the services are provided) and an assurance element (cost accrual at the time the good is transferred).

Principal vs. agent

The new standard changes the guidance used to evaluate whether an entity is a principal or an agent.

Credit risk is no longer an indicator that an entity is a principal.

An entity identifies each specified good or service to be transferred to the customer, and determines whether it is acting as a principal or agent for each one. In a contract to transfer multiple goods or services, an entity may be a principal for some goods and services and an agent for others.

An entity is a principal if it controls the specified good or service that is promised to the customer before it is transferred to the customer.

Indicators that an entity has obtained control of a good or service before it is transferred to the customer are having primary responsibility to provide specified goods or services, assuming inventory risk, and having discretion to establish prices for the specified goods or services.

Contract modifications

A general accounting framework replaces specific contract modification guidance for long-term construction- and production-type contracts. However, outside of these arrangements, an entity will find more guidance in the new standard than under current GAAP.

The new standard requires an entity to account for modifications either on a cumulative catch-up basis (when the additional goods or services are not distinct) or a prospective basis (when the additional goods or services are distinct).

If any additional distinct goods or services are not priced at their stand-alone selling prices, the remaining transaction price is required to be reallocated to all unsatisfied performance obligations, including those from the original contract.

Contract costs

More costs are expected to be capitalized under the new standard.

An entity cannot elect to expense or capitalize. Capitalization is required when the criteria are met.

The new standard provides guidance on the following costs related to a contract with a customer that are in the scope of the new standard:

- incremental costs to obtain a contract; and
- costs incurred in fulfilling a contract that are not in the scope of other guidance.

Incremental costs to obtain a contract with a customer (e.g. sales commissions) are required to be capitalized if an entity expects to recover those costs – unless the amortization period, which may include anticipated contracts or renewals, is less than 12 months.

Fulfillment costs that are not in the scope of other guidance – e.g. inventory, intangibles, or property, plant, and equipment – are capitalized if the fulfillment costs:

- relate directly to an existing contract or specific anticipated contract;
- generate or enhance resources that will be used to satisfy performance obligations in the future; and
- are expected to be recovered.

An entity amortizes the assets recognized for the costs to obtain and fulfill a contract on a systematic basis, consistent with the pattern of transfer of the good or service to which the asset relates.

The impact on your organization

Implementation of the new standard is not just an accounting exercise.

New revenue recognition standard and corresponding accounting changes

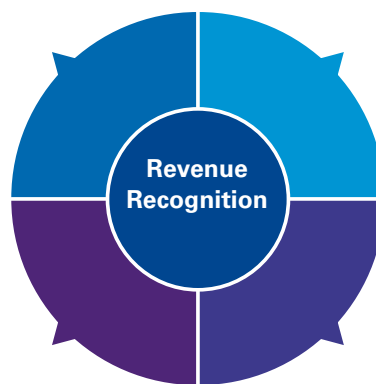
- Impact of new revenue recognition standard and mapping to new accounting requirements
- New accounting policies – historical results and transition
- Reporting differences and disclosures
- Tax reporting/planning

Revenue recognition automation and ERP upgrades

- Automation and customization of ERP environment
- Impact on ERP systems
- General ledger, sub-ledgers and reporting packages
- Peripheral revenue systems and interfaces

Financial and operational process changes

- Revenue process allocation and management
- Budget and management reporting
- Communication with financial markets
- Covenant compliance
- Opportunity to rethink business practices
- Coordination with other strategic initiatives



Governance and change

- Governance organization and changes
- Impact on internal resources
- Project management
- Training (accounting, sales, etc.)
- Revenue change management team
- Multinational locations

As noted in the chart, the new standard could have far-reaching effects. The standard may not only change the amount and timing of revenue, but potentially requires changes in the core systems and processes used to account for revenue and certain costs. Entities may need to design and implement new internal controls or modify existing controls to address risk points resulting from new processes, judgments, estimates

and disclosures. The implementation of the new standard will involve a diverse group of parties (e.g. Tax, IT, Legal, Financial Planning, Investor Relations, etc.) and entities should have a governance structure in place to identify and manage the required change. For more information about implementation challenges and considerations, see chapter 14 of KPMG's [Revenue: Issues In-Depth](#).

KPMG Financial Reporting View



Insights for financial reporting professionals

As you evaluate the implications of new financial reporting standards on your company, KPMG Financial Reporting View is ready to inform your decision-making.

Visit kpmg.com/us/frv for news and analysis of significant decisions, proposals, and final standards and regulations.

FRV focuses on major new standards (including revenue recognition, leases and financial instruments) – and also covers existing US GAAP, IFRS, SEC matters, broad transactions and more.



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Insights for financial reporting professionals

Here are some of our resources dealing with revenue recognition under the new standard.

Handbook	Assists you in gaining an in-depth understanding of the new five-step revenue model by answering the questions that we are encountering in practice, providing examples to explain key concepts and highlighting the changes from legacy US GAAP.
Issues In-Depth	Provides you with an in-depth analysis of the new standard under both US GAAP <i>and</i> IFRS, and highlights the key differences in application of the new standard. Additionally, chapter 14 provides implementation considerations.
Illustrative disclosures	We show how one fictitious company has navigated the complexities of the revenue disclosure requirements.
Transition options	Assists you in identifying the optimal transition method.
Industry guidance	See our other industry guidance.

Contacts

KPMG is able to assist chemical manufacturers as they navigate the adoption of the new standard.

Mike Shannon

Partner

U.S. Chemicals Audit Leader

51 John F. Kennedy Parkway
Short Hills, NJ 07078
Tel: 973-912-6312
mshannon@kpmg.com

Brian K Allen

Partner

U.S. Revenue Topic Team Leader

345 Park Avenue
New York, NY 10154
Tel: 212-954-3621
ballen@kpmg.com

Prabhakar Kalavacherla ("PK")

Partner

Global Revenue Topic Team Leader

55 Second Street, Suite 1400
San Francisco, CA 94105
Tel: 415-963-8657
pkalavacherla@kpmg.com

Dan Langlois

Partner

Department of Professional Practice

345 Park Avenue
New York, NY 10154
Tel: 212-872-3256
dlanglois@kpmg.com

Meredith L Canady

Partner

Department of Professional Practice

345 Park Avenue
New York, NY 10154
Tel: 212-909-5858
mcanady@kpmg.com

kpmg.com/socialmedia



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